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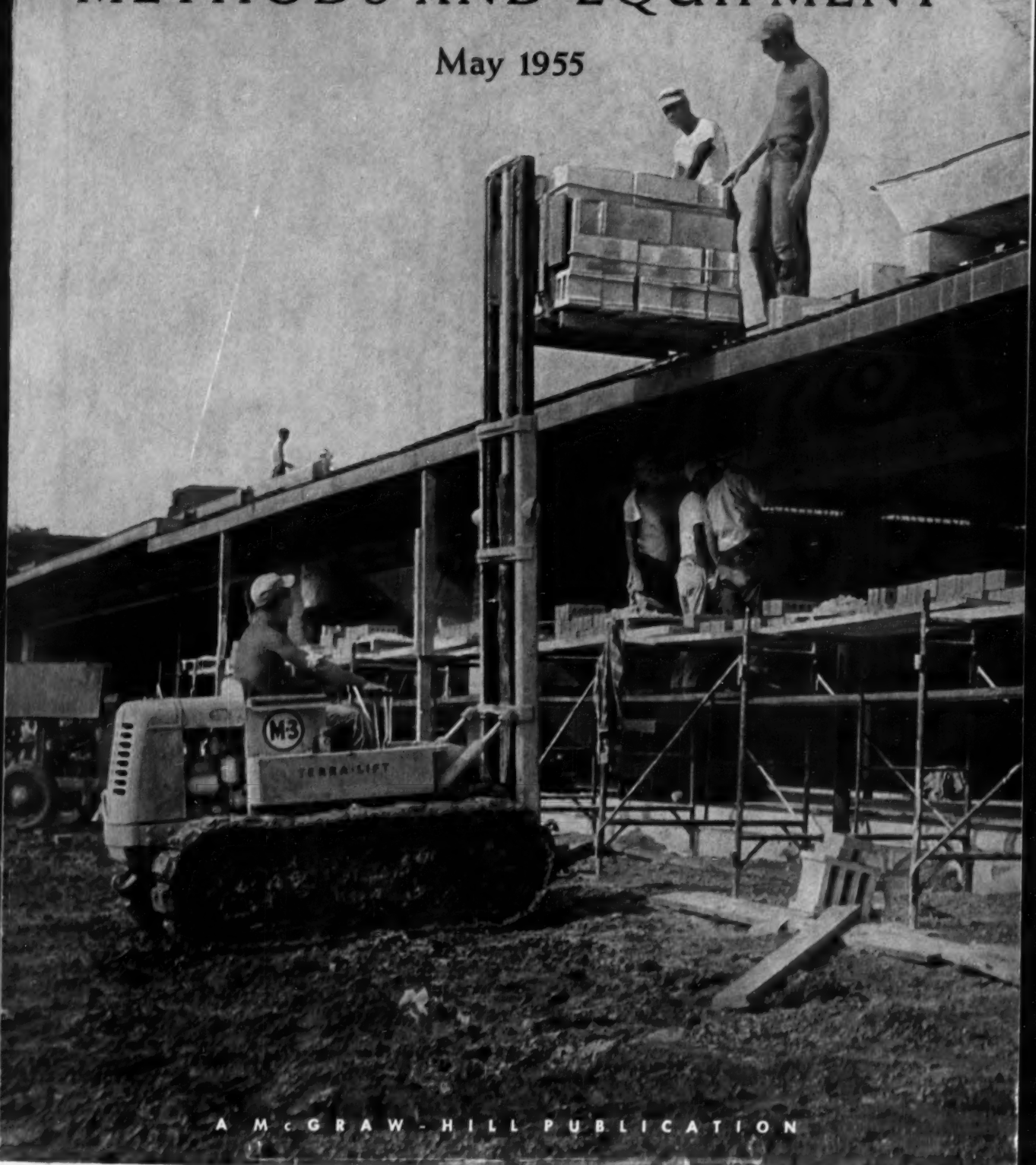
CONSTRUCTION METHODS AND EQUIPMENT

May 1955



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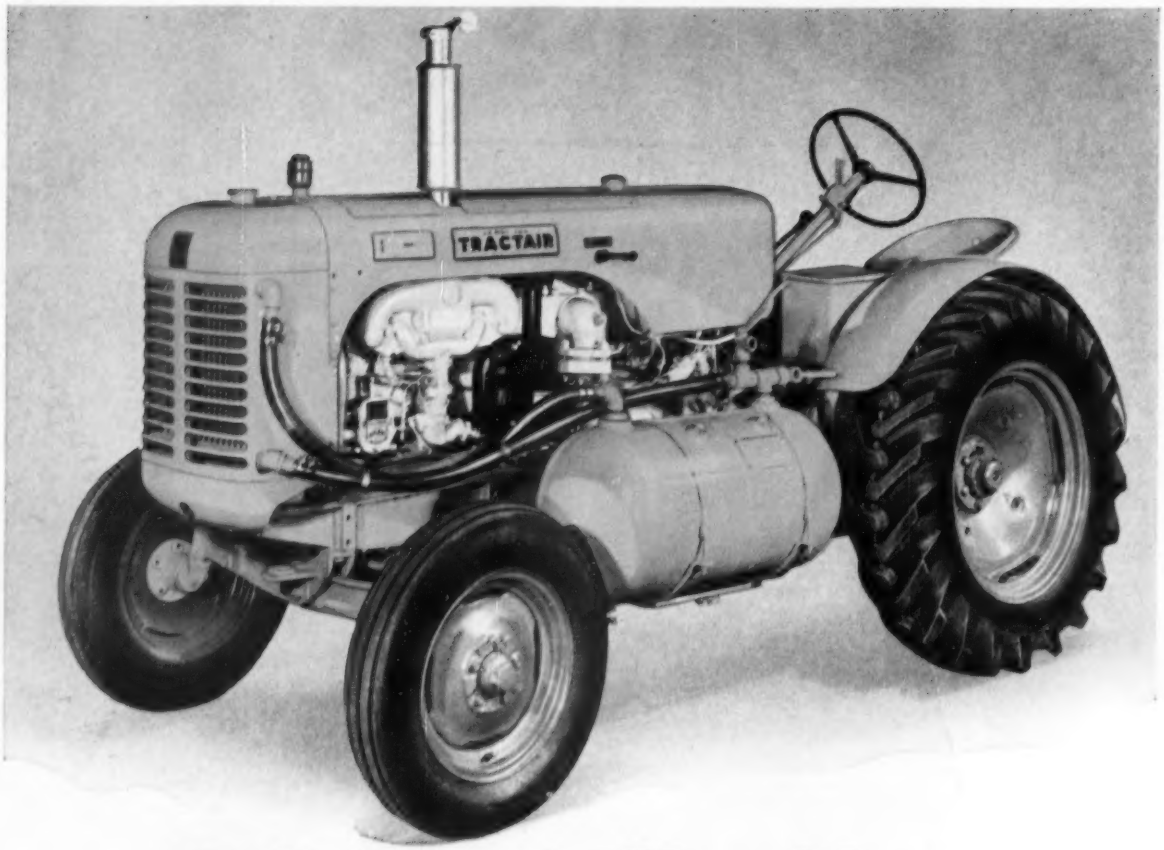

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T-36

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B.F.Goodrich

Sand company gets 95,000 miles with recaps from all-nylon All-Purpose tires

MUSGROVE Sand Company trucks haul sand and gravel to construction sites within a 45 to 50-mile radius of Albany, Ga. Working as many as 75 hours a week, these trucks travel over all types of roads in all types of weather. B. F. Goodrich tires are used 100%—chosen, says owner V.W. Musgrove, because they cut costs.

B. F. Goodrich All-Purpose tires are built with an *all-nylon* cord body. Nylon is stronger than ordinary cord materials, withstands double the impact and resists heat blowouts and flex breaks. The *all-nylon* cord body outwears even the extra-deep All-Purpose tread—up to 67% deeper than that of a regular tire—and can still be recapped over and over! Musgrove reports that with 2 recaps he gets 95,000 miles of service from *all-nylon* All-Purpose tires!

All-Purpose cleats are curved to grip better, on or off the road. "Buttons" on alternate cleats resist skidding. And as the center rib wears, it widens, putting more and more rubber on the ground, decreasing the rate of wear. All this, plus B. F. Goodrich compressed tread construction that resists abrasion and adds mileage, means that this sand company's tire dollars go farther.

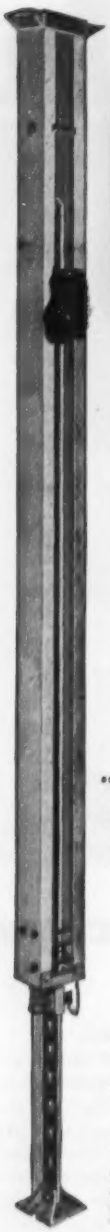
See new *all-nylon* All-Purpose tires (rayon construction available at lower prices) at your B. F. Goodrich retailer's. His address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.*

SUPER EXPRESS TIRES used on front wheels here will give about 150,000 miles of service with recaps, V. W. Musgrove reports.

"ALL-NYLON All-Purpose tires have definitely shown that they give much better than average service," owner Musgrove writes.

Specify B. F. Goodrich tires when ordering new equipment.

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER



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★ **SQUARE COLUMNS**
Automatically and accurately

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Volume 37
Number 5

CONSTRUCTION METHODS AND EQUIPMENT

Established 1919

May 1955

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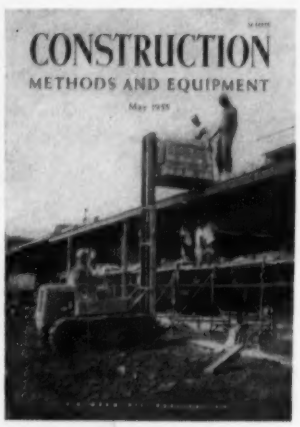

On the Cover . . .

Terratrac tractor with fork-lift attachment hoists palletized concrete blocks up to working area on a Milwaukee supermarket project. The 30-hp tractor proved to be a profit-saver for Contractor Del Mickelson. Shortly after he purchased it, two weeks of steady rain turned his job into a quagmire. He put the tractor to work in the gooey muck and even though the mud was 1½ ft deep, the tractor came through. (For full story see page 78).

COMING IN JULY—Valuable maintenance information will fill the entire July issue of *Construction Methods and Equipment*, which that month will be devoted entirely to helping the contractor keep his equipment productive at lowest cost for longer periods. Included will be an up-to-date listing of service manuals.

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Pay Dirt in This Issue

May, 1955

Shield Deflects Niagara for Daring Cofferdam . . 58

Protected from 25-mph current by a steel-sheeted shield, a 350-ft sheetpile-and-stone cofferdam is built out into the river. Steel cables to an island 1,300 ft upstream anchor the unit, which is moved ahead as the cofferdam advances.

Thruway Carves Path Across Busy Suburb 64

A tangled stretch of 10-lane highway in Yonkers, N. Y. is costing more than $5,000,000 a mile. Besides eight major structures, there are hundreds of tricky utility relocations, and miles of retaining walls. Job bristles with good ideas.

Tractor-Mounted Conveyor Quickly Loads Cars . . 70

A double line of 60 railroad cars is filled with sand every day by a 36-in. belt conveyor mounted on a crawler tractor. An adjustable spout easily reaches either line of cars.

Splice 160-Ft Timber Piles for Fenders 84

A 65-ft untreated bottom section is joined to a 95-ft creosoted top for driving in one piece for the Richmond-San Rafael Bridge. Special rig shapes piles for splice timbers.

Self-Propelled Cage Welds Wall Plates 90

Horizontal joints between wall plates of storage tank are welded automatically by cage riding rim of top plate.

Concrete Mixing and Placing 113

The role of concrete buckets, receiving hoppers and chutes is discussed, along with ways to deposit the mix properly.

Tailored Aggregate Plant Meets Tough Specs . . 154

Modest auxiliary units and job-made alterations help basic portable plant turn out 330,000 tons of stone in a hurry.

Varied Machines Dig Tight-Quarter Pit 174

To make 27x137x30-ft deep rock cut within an existing building, type of excavating equipment has to be changed.

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NEXT MONTH

Driving a tunnel inside out is a departure from conventional methods. But that's the way Guy F. Atkinson Co. drove the Waldo Tunnel on an approach to the famed Golden Gate Bridge. Read the full story of how they did it, in the June issue.

(Advertisement)

Tough Construction Jobs
Rely on Gorman-Rupp Pumps

Tremendous problems frequently face workers on construction projects. Flood waters delay operations, cofferdams split or spring leaks, the river pours in. Men take risks to meet scheduled target dates.

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Gorman-Rupp pumps are meeting such challenges every day. Ohio Turnpike bridge problems were classic examples. Continuous pumping was necessary to keep the cofferdams dry for construction of piers. The contractor, George Vang, Inc., of Pittsburgh, placed 10 Gorman-Rupp pumps on the job. Charles Solander, pump operator, states: "I've had them running 3 weeks at a time, 24 hours a day, and no trouble".

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NOTES FROM THE FIELD - -

Bridging Kokosing River on U. S. Route 36 at Mount Vernon, O. Model 3D-E1½ diaphragm pump and model 3362-B contractors' pump, both electric powered, and model 3205 contractors' pump engine powered - On The Job.

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On a previous job their Cleveland backfiller had saved them considerable time and money on a 12-inch water line trench, averaging approximately 6 feet deep, by its unique ability to backfill spoil deposited on a down slope on the far side of the trench, while simultaneously tamping it to the state of Virginia's rigid compaction specifications.

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Investigate this remarkable time, labor and machinery saving tool now—so that you, too, can realize its outstanding benefits on your next job.

See your local distributor for the full Cleveland story or write direct to:

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Job Talk...

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It took Holland & Cox, Inc., Florida land-clearing contractors, 27 yrs to work out a design for a rock plow to remove and pulverize coral rock that satisfied them, but now they have one they believe is the final answer.

The plow, mounted on the front of a Caterpillar D8 tractor, moves rock off to the left side only. To remove the tendency of the plow to pull the tractor sideways, the cable-controlled plow is mounted off-set on the A-frame. The tracks of the tractor do not pulverize the uprooted rock sufficiently, so the tractor pulls a Hyster grid roller weighted with cement blocks to complete the job.

Sturdy Instrument Pedestal

Any engineer who has had to make a tough instrument setup on a building construction job will appreciate the advantages of a novel, sturdy instrument pedestal mountable on any steel column.

Developed by Tom Rome, superintendent for Walsh-Fuller-Slattery, general contractors, the pedestal eliminates the necessity

(Continued on page 14)

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(Bureau of Reclamation Photo)

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like the modern Detroit Expressway, with its many interchanges designed for easy, safe access to this high speed highway . . . a good example of the big job being done by the construction industry to help meet the country's highway needs.

(Abrams Aerial Survey Corp. Photo)

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like the Park La Brea housing project in Los Angeles. Costing $40,000,000 and providing living quarters for 13,000 people, this unit is the largest architectural concrete project in the country.

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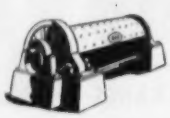

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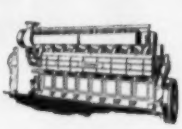

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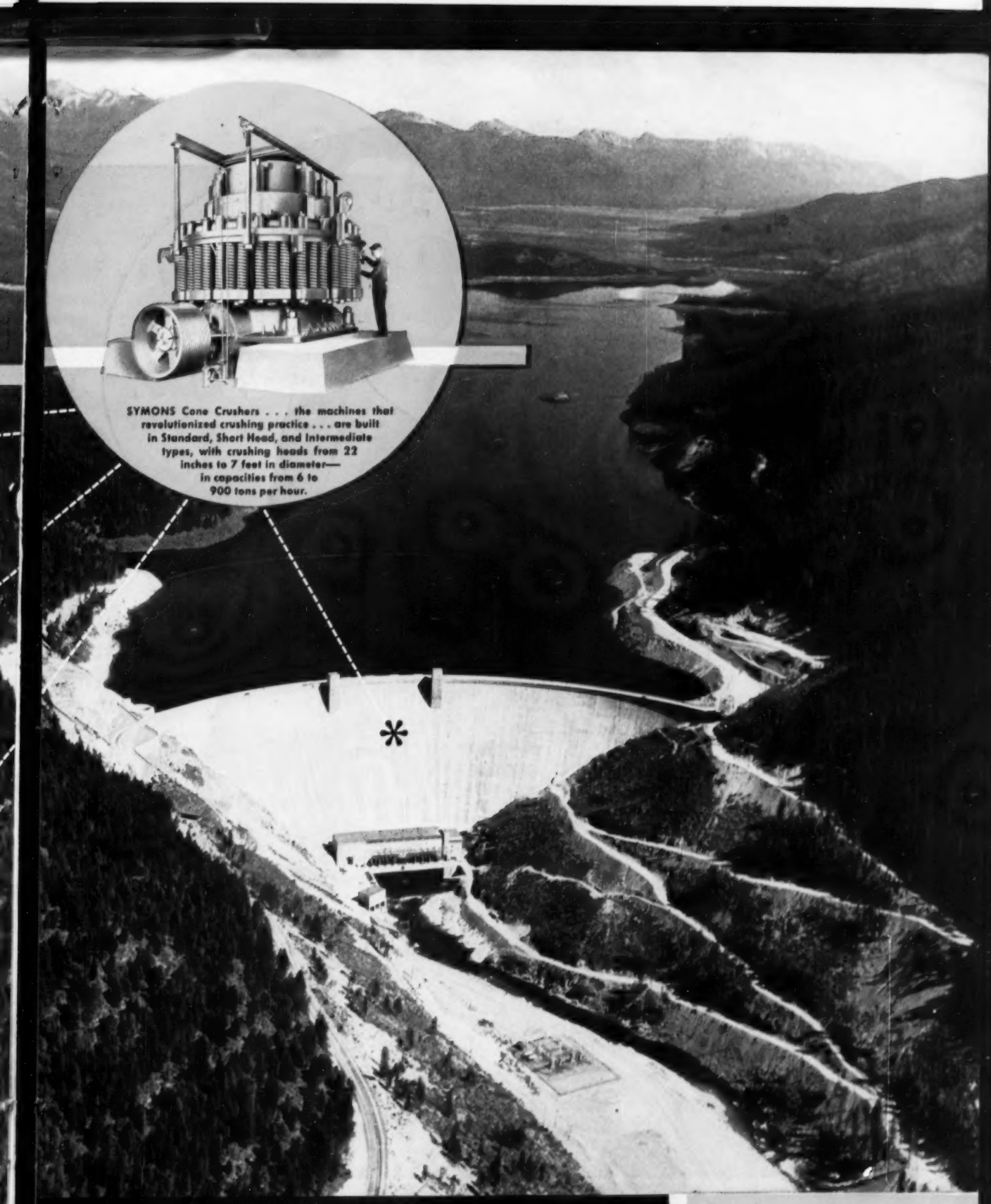

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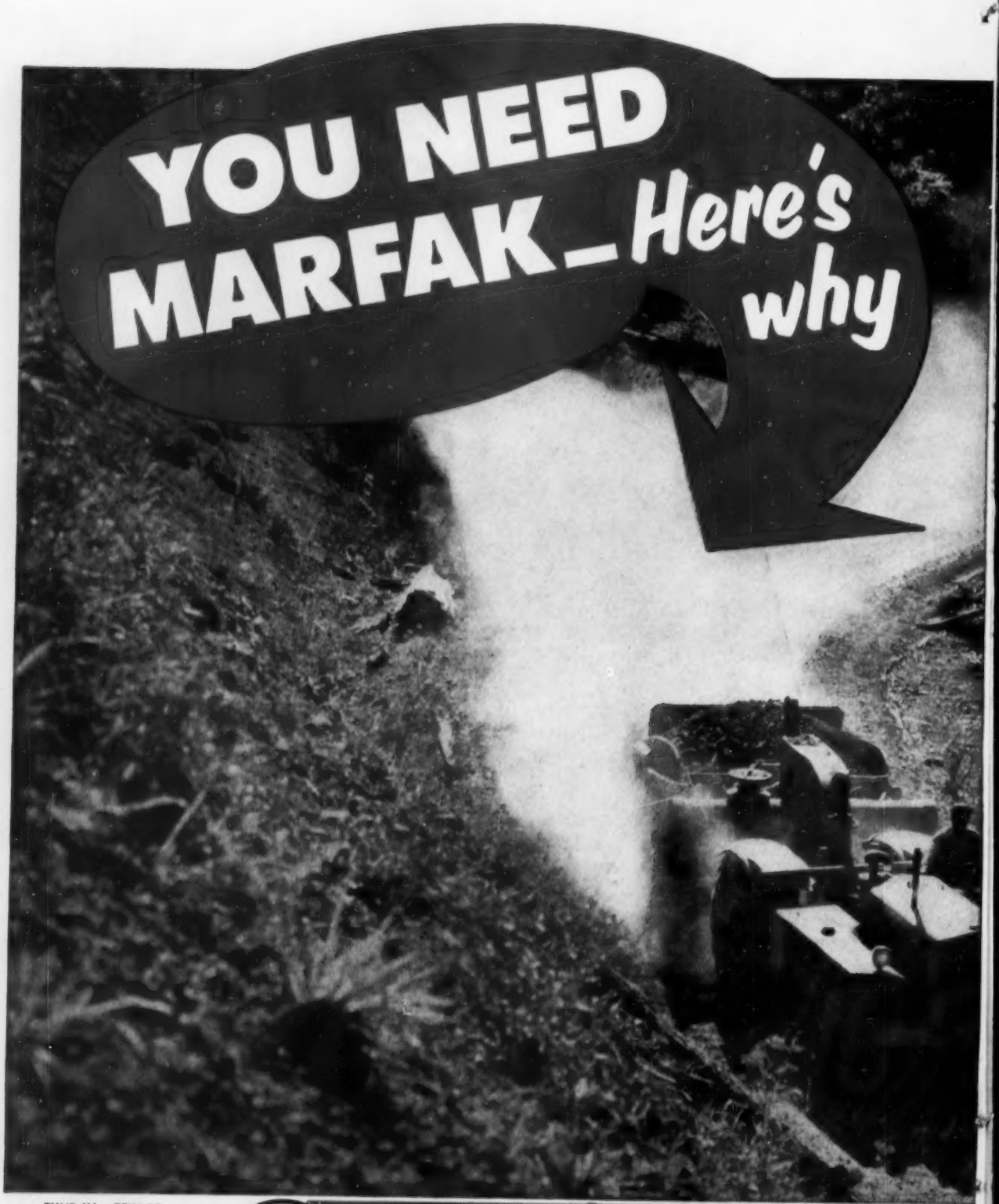

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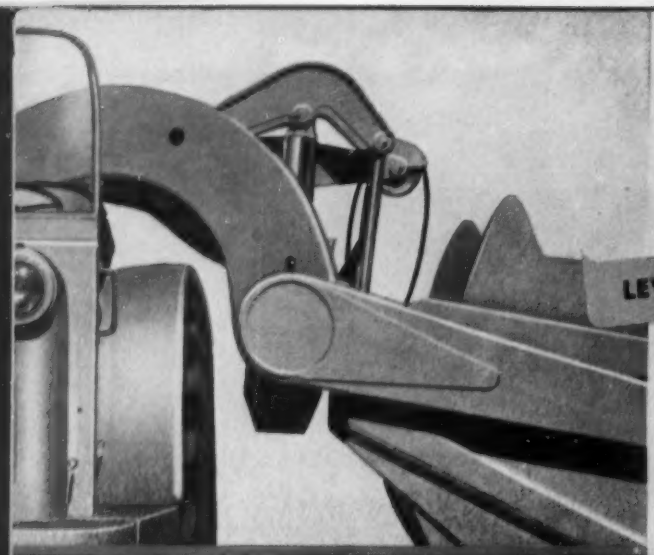
The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

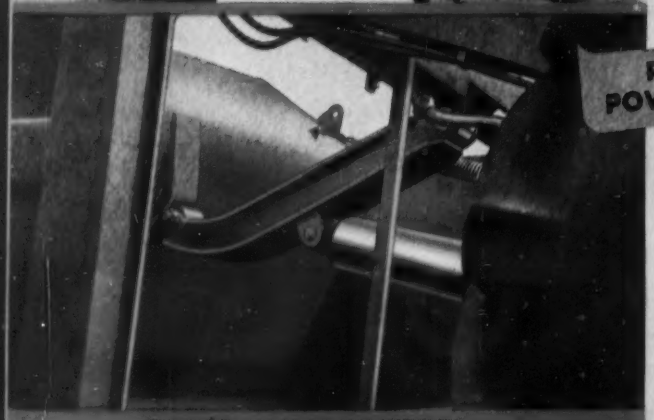
FOR ALL CONTRACTORS' EQUIPMENT



Here's the New

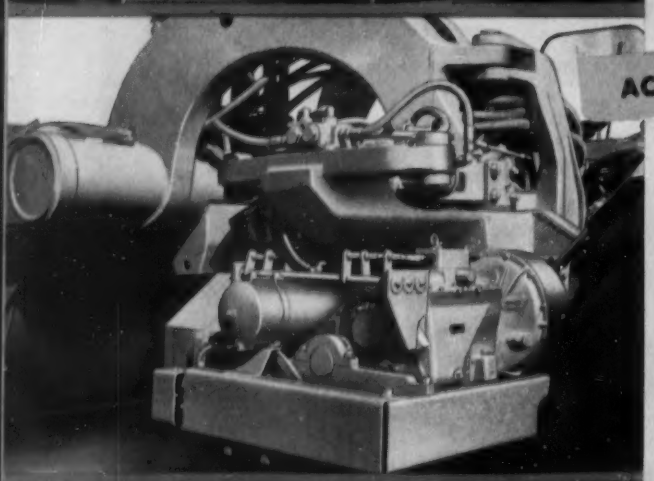
LEVER ACTION

Lever action, an exclusive Euclid feature, does away with cable headaches for good . . . only 12 ft. of cable used for the apron lift. All scraper operations, bowl, apron and ejector, are actuated by levers with independent hydraulic control . . . they're fast and positive . . . not interconnected in any way. All four of the hydraulic jacks are interchangeable . . . one spare fits anywhere!



ROLL-OUT POWER EJECTOR

Roll-out power ejector is independently controlled—dumps capacity loads, even wet, sticky material, fast and clean. Maximum power is available at start of the dumping operation when it is needed most. Cam and roller action speeds up ejector action near the end of the dumping operation. High apron lift permits fast, free ejection of big loads.



ACCESSIBILITY

Accessibility of major components — engine, clutch, transmission and drive axles—is a time saving, cost cutting feature of the S-7 design. Repairs or replacement do not require a major disassembly job. Removal of components takes about half the time required for other small scrapers. Easy servicing and maintenance keeps down time to a minimum—means more payloads per hour.

FOUR SECTION CUTTING BLADE

A four section cutting blade provides most efficient loading in any material. Each section is reversible and interchangeable to give longer life and permit the straight or drop center blade arrangements best suited for job requirements. A new cutting edge for any blade arrangement can be obtained by simply reversing or interchanging the sections.

S-7 "Euc" Scraper

This "Euc" S-7 is the newest addition to Euclid's Scraper line—fastest growing line in the industry because of customer acceptance and preference. It incorporates many of the features that have made larger Euclid Scrapers tops in production and efficiency . . . and has greater accessibility than any previous "overhung" scraper on the market.

Built to Euclid's standards of rugged construction for long service life, the S-7 is engineered throughout for good accessibility of all major components, for fast loading and travel, and for ease of operation. The entire power train—engine, clutch, transmission, planetary drive axle, etc.—is easy to get at for servicing, repair or replacement. This is a mighty important cost cutting feature in a single axle prime mover.

•

Before you buy your next small scraper, check the profit making features of the S-7. Your Euclid dealer can show you how this new "Euc" can get more work done at lower cost than any other scraper of comparable size.

POWER and PERFORMANCE

With 143 h.p. this 7 yd. "Euc" has power and performance that's unequalled in small scrapers. . . 20 h.p. for every yard of capacity . . . 18.00 x 25 tires . . . and a top speed of 25 m.p.h. with full payload.

MANEUVERABILITY

Maneuverability—so important for close quarter work—is excellent with the S-7. Full power steering and hitch design of the two-wheel tractor provides a 29 ft. non-stop turning radius. The 18.00 x 25 or 21.00 x 25 (optional) tires have large rolling radius for good traction and flotation.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

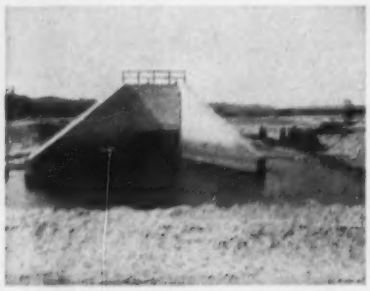
GM GENERAL MOTORS

HOW TO HANDLE
WET JOBS

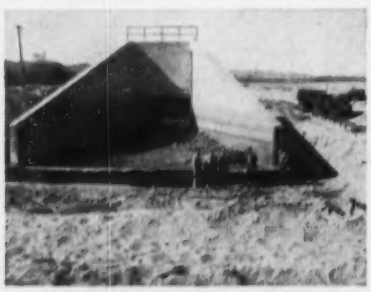
BRIDGE PIER
COFFERDAM

Winona, Minn.

Contractor: James Construction Co.



BEFORE DEWATERING. Earth cofferdam is shown around damaged and tilted center pier of bridge which had been washed away by Mississippi Spring floods. Griffin Wellpoint system (see photo, right) has 640-ft perimeter.



WITHIN 12 HRS, the 2 pumps have brought water below subgrade, wresting 5000 gal per min from the very coarse sand and gravel.

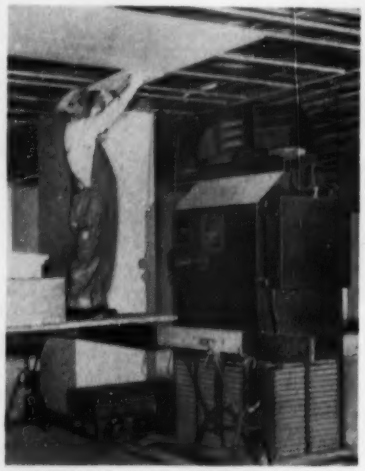
IN INSTALLATION, the wellpoints on this job had to be driven the last few feet, through gravel. Fortunately, Griffin's is the only point specifically designed for driving as well as jetting. Contractor was thus enabled to "breeze through" what might otherwise have proved a big headache.

GRIFFIN
WELLPOINT CORP.
881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
In Canada: Construction Equipment Co., Ltd.
Toronto Montreal Halifax

JOB TALK . . . Continued from page 6

for heartbreaking setups on slippery oiled forms or narrow structural members. It also furnishes insurance against the accidental nudge of a passing workman.

The pedestal was fabricated by Empire City Iron Works from standard aluminum sections and an instrument head. Weighing only 7½ lb, it is lighter by 3 to 7 lb than standard instrument tripods and considerably less bulky and easier to manage when climbing about on a building frame. It can be secured to any vertical steel member by a C-clamp and brought to level by the instrument head screws.



Something to Keep in Mind Next Winter

ONE OF THE REASONS the Prudential Building in Chicago will be finished on time in September is because of temporary installed oil-fired, forced-air heaters used this last winter. Dravo Counterflo heaters helped keep inside temperatures as much as 40 deg higher than outside. According to George A. Fuller Co., general contractors, use of the heaters brought about an estimated 35% reduction in costs over previous methods of construction-job heating.

The heaters have an output capacity of 500,000 btu per hr and handle 5,500 cu ft of air per min.

Summer's Comin'!

HERE ARE THINGS to do to prepare your equipment for busy summer days ahead. And to help you year-round, CONSTRUCTION METHODS AND EQUIPMENT will publish in July its seventh annual issue devoted exclusively to equipment maintenance. Watch for it! In the meantime, follow these valuable maintenance tips:

Cooling System

Drain and flush to remove rust and sludge. A clogged cooling system slows circulation, causes engine to overheat. To remove heavy lime scales or other deposits that will not flush out, use sal soda or any other good cooling system cleanser. When engine has cooled, flush with clean water. If your solvent requires neutralizer, flush with recommended solution. Check radiator, hose or connections for leaks. Be sure connections are tight. Repair or replace damaged parts.

Radiator

If fins are clogged with dirt, clean with stream of air or water. If fan is puller-type, force air from back (fan side) to front side of core. If pusher-type, force air through front to back. Keep cooling system filled with clean water. Be sure water is free from lime or alkali. Alkali water will corrode metal parts. Lime water forms dangerous deposits in cylinder head and block. To prevent rust, add rust inhibitor to coolant.

Water Pump

Check to see that water pump is in good condition—that its pulley or fan belts are not slipping. Belts have proper tension when they can be pushed down about ¾ in. with normal thumb pressure. Proper water circulation is important.

Engine

Nothing can operate under a blanket of dirt, and engines are no exception. Use a wiping rag to keep the outside of the engine clean. Also remember to clean dirt, oil and debris from the bottom of the engine compartment.

Oil

Drain heavy, winter-weight oils from engine crankcase, transmission, final drive and gear boxes. Use a good flushing oil to remove sediment and sludge. Refill with good quality, summer-weight oil. (Refer to your equipment manuals for recommended oil weight.) Do not try to economize by using winter-weight oil in summer. The lighter oil will not lubricate properly, and expensive damage to equipment can result. Using oil recommended for specific seasons is good sense. — (From LeTourneau-Westinghouse Co.'s "Co-Operator")

FOR MOVING EARTH, ROCK, COAL AND ORE

They asked the man who'd used one!*

* SUPERIOR CEMENT FINISHING MACHINE!

Here is San Francisco's new four million dollar Downtown Center Garage. Mr. Larkin, general superintendent of Cahill Construction Co., the nationally known general contractors on this project says of the Superior Cement Finishing machine:

"We couldn't find a machine that would do a satisfactory finishing job on the non-skid topping we were putting down. Our Los Angeles supervisor recommended the Superior Cement Finishing machine, based on his experience with it on the Braun Knecht & Heiman warehouse in Los Angeles.

On his advice, we used the Superior cement finishing machine on the whole 450,000 square feet of the Downtown Center Garage, because we quickly found it was the only machine that could do the precision floor finishing job we required."

Yes . . . Superior does the job, with ease and dispatch. Precision-engineered, geared to tackle the toughest job, the rugged Superior is built to last . . . and to operate consistently at lowest possible maintenance cost. If you are figuring a job—make sure you find out about Superior first.

Only SUPERIOR has ALL of these features:

Successful combination floating and troweling blade (one set of blades for floating and finishing).

Tangential arm mounting on a 4 point suspension (greater stability, most accurate running balance).

Four blades for the truest, really level floor (a three-legged stool fits any floor, a four-legged stool NEEDS a *level* floor).

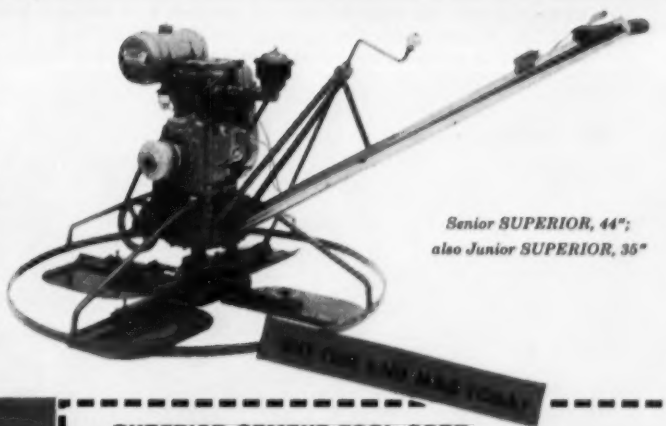
Stationary guard ring attached to the base (more blade protection. Machine works close to walls and obstructions).

Crank adjustment for blades (added leverage assures easiest, most accurate tilting while in operation).

Mercury switch for the greatest safety (insures against runaway, yet never a dead engine).

Distributors and Dealers throughout the country (parts and service are always available).

Two rugged sizes available, both with all of the de luxe features (the Senior SUPERIOR, 44" and the Junior SUPERIOR, 35").



Senior SUPERIOR, 44";
also Junior SUPERIOR, 35"

Superior Cement Tool Corp.

11616 WRIGHT ROAD, LYNWOOD, CALIFORNIA

SUPERIOR CEMENT TOOL CORP.
11616 Wright Road, Lynwood, California Dept. M-5

☐ I want complete specifications on SUPERIOR CEMENT tools.
☐ Please have sales representative call on me.

Name_____

Position_____ Company_____

Address_____

City_____ State_____

This big POWERHOUSE

Stripping hot mix asphalt from its concrete base without benefit of scarifying! The MICHIGAN also demonstrates its ability to get a heaping bucket load even at ground level—and transport it only a few inches off the ground.

CLARK EQUIPMENT

Push-loading a scraper for A. J. Raisch, San Jose, Cal.—a real test of power and traction. You can use a MICHIGAN where you've never been able to use rubber-tired Tractor Shovels before—versatility that cuts your costs.

City State

handles bigger jobs cheaper!

Look at these specs of the 2¼ yd MICHIGAN 175A

BUCKET CAPACITY	**2¼ cubic yards**
LIFTING CAPACITY	**15,000 lbs.**
HORSEPOWER: Diesel . . . 133; Gas . . . 126; Supercharged . . . 165	
WEIGHT	**24,100 lbs.**
SPEEDS	**Up to 27 m.p.h. Forward or Reverse**

Don't look for "comparative" data on the MICHIGAN 175A—there is *no machine comparable.* This big bruiser is nearly 50% bigger than the next closest machine on the market. It's literally in a class by itself. From fly-wheel to bucket, the 175A is built to do bigger, heavier jobs—jobs that no other rubber-tired machine can handle.

Better traction and flotation. With the MICHIGAN's exclusive power train—300% torque multiplication, power shift transmission (no engine clutch) and planetary wheel axles—you get a shockless flow of power right down to the ground. There's no surge, no wind-up in the axle shaft, no wild wheel spin. The operator has feather-touch control over his wheels; in weak soil conditions or mud, he can ease off or step up the power to keep from digging in. With this kind of smooth power transmission, you get the full advantage of the MICHIGAN's extra weight and power—you dig material *out*, you don't dig the machine *in*.

Independent power at the cutting edge. The 175A bucket action gives you independent power right at the cutting edge of the bucket. With two big double-acting bucket cylinders, you can ease up to a pile of tough material and dig your way into a heaping bucket load. On other machines, you'd have to ram headlong into the pile to try to get penetration—and you'd probably still get only half a load. We'll match the MICHIGAN's digging ability against any make or type of Tractor Shovel, bar none.

Hydraulic power does the work. In spite of its size and power, the MICHIGAN 175A is easier to operate than most machines one-third its size. Hydraulic power does all the real work: power steering, 4-wheel power brakes, power-shifting with two simple levers on the steering column, no clutch pedal.

Warning: don't let your operator get on a MICHIGAN unless you're willing to buy one! After an hour on a MICHIGAN, he'll not be satisfied with any other Tractor Shovel.

See it in action! We'll prove that the MICHIGAN is in a class by itself in the Tractor Shovel field: your local MICHIGAN distributor will arrange a demonstration—on your own job, if you wish. Or write for 12-page Tractor Shovel booklet containing explanation and cutaway drawings of the MICHIGAN power train. Any MICHIGAN is available on a low-cost Lease Plan—ask for brochure which explains how you can use it.

CLARK EQUIPMENT COMPANY, Construction Machinery Division, 380 Second St., Benton Harbor 30, Michigan—Phone WA 6-6184

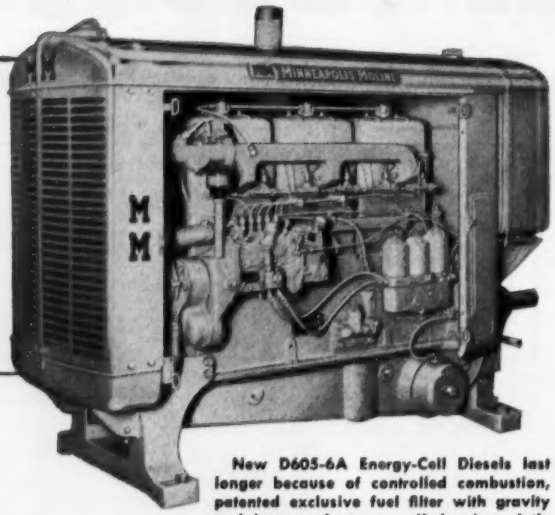
6000-lb. steel truss, 60 ft. long, is transported from rail siding to steel-setting cranes on Austin Co. job in Michigan. The extra weight and power and inherent stability of the MICHIGAN Tractor Shovel give it the capacity to handle heavy yard-jobs like this.

Cold crusted asphalt tests the digging ability of any machine. Here the MICHIGAN breaks out a 9000 lb. heaping bucket load. When the operator steps on the brake, the power-shift transmission automatically goes into neutral—puts full power into the bucket action.

WHY IT PAYS TO OWN INDUSTRIAL DIESELS WITH REMOVABLE CYLINDER BLOCKS AND HEADS

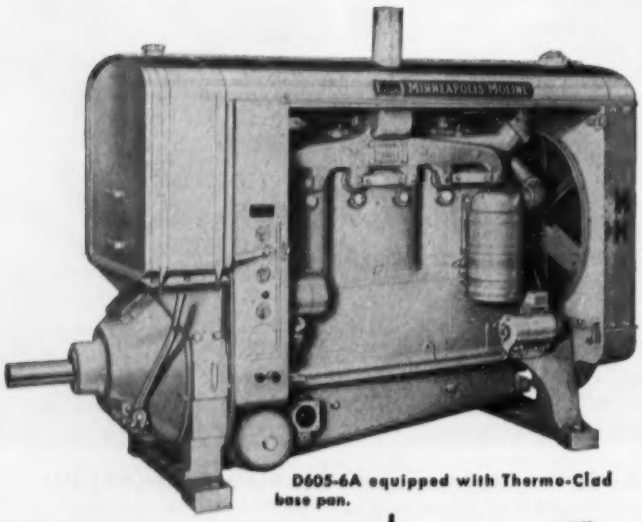
New MM diesels were developed with *energy-cells* to make them last longer, do more and go farther with less down-time and maintenance.

To provide owners with lower cost maintenance when necessary MM diesels are the most advanced and soundly engineered because the cylinder blocks are cast in pairs separate from the crankcase.



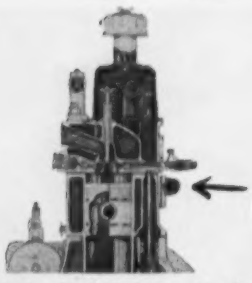
New D605-6A Energy-Cell Diesels last longer because of controlled combustion, patented exclusive fuel filter with gravity and by-pass features, self-cleaning pintle type nozzle, directed cooling of area around combustion chambers.

YOU GET THESE ADDED ADVANTAGES . . .

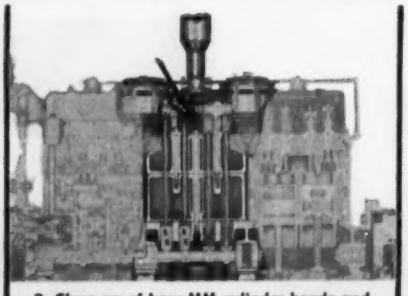


D605-6A equipped with Thermo-Clad base pan.

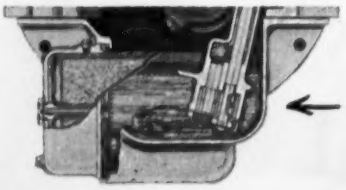
1. Ease of maintenance and low cost emergency service because paired cylinder blocks, pistons, and rods can be removed as a unit by one man.
2. Prolonged time between overhauls by use of close-grain cast iron that provides best cylinder lubrication for reduced wear.
3. Less service due to minimum distortion as MM cylinder heads, cylinder blocks and crankcase are virtually strapped together by full-length steel studs anchored in the main bearing bulkheads. (Transmits combustion pressure to heavy crankcase that has extra depth below center line of crankshaft.)
4. Efficient operation obtained by uniform cylinder expansion . . . the result of controlled cooling and long oil-cooled cylinder wall skirts below ring travel area.
5. "New engine" performance at extremely nominal cost can be obtained right in the field without special tools using factory matched cylinder blocks, pistons, pins, and rings. (Blocks are dowelled to crankcase to assure bore is square with crankshaft and pistons are precision fit to bore . . . equivalent to a factory job.)
6. Lower initial cost stems from high production parts by casting cylinder blocks in pairs separate from the crankcase.



1. Cylinder head and block assembly shows coolant entrance at hottest point first and extra long skirt wall construction.



2. Close-up of how MM cylinder heads and blocks and crankcase are tied into a single rigid unit with long studs.



3. A D283 feature is extra large oil filter enclosed in base pan, floating-screen oil pump intake, and pump located in bottom of base pan.

Optional Thermo-clad water-blanketed base pans for all units also have oil filter included to give more effective filtering.

INDUSTRIAL MM MODERN MACHINERY DIVISION

MINNEAPOLIS-MOLINE

MINNEAPOLIS 1, MINNESOTA

You Said It...

AT A RECENT used equipment auction held at H. O. Penn Machinery Co., Inc., New York, N. Y., we queried several contractors who were attending. We wanted to learn how they felt about such auctions, so asked:

"What Do You Think of Used Equipment Auctions?"

THE ANSWERS:

A. J. Rusciano, president, Rusciano & Son Corp., New York, N. Y.: "I believe they are on the right track. The auction gives the little fellow a chance on the big stuff. He can buy them at a fair price and he can get some bargains."

Joe Drinane, chief engineer, Elmhurst Contracting Co., Corona, N. Y.: "I'm here because I'm curious. Our policy is to buy new equipment. Auctions are a good idea for a small contractor. He can pick up some bargains."

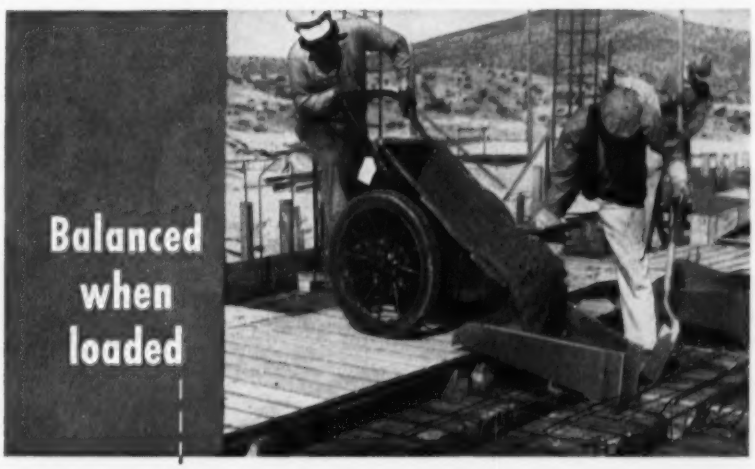
Arnold Kagan, president, Five Boro Construction Corp., New York, N. Y.: "I look for auctions like this one, because I buy lots of used equipment. We send a man up the day before the auction to look the equipment over, then we decide what we want to buy and how high we'll bid on it. You have to know what you're buying."

Thomas Lepor, Jr., contractor, Cape May, N. J.: "This is the first used equipment auction I've ever been to. I think they're all right, but you sure have to be on your toes. I let a couple of good buys get away from me, because I didn't bid fast enough."

Louis Toffolon, president, White Oak Excavators, Inc., Plainville, Conn.: "I think auctions are all right as long as they are conducted like this one is. I've been to a couple that scared me to death. So far today I've purchased a paver and three DW-21's and scrapers."

GAR-BRO CONCRETE CARTS

INSURE *Full Capacity* LOADS



HANDLES 30% MORE load with half the effort.

LIGHTWEIGHT—¼ to ⅓ lighter than ordinary carts.

ROCKER DUMP type carts are available for handling dry concrete.

HIGH TRAY permits hauling lumber, forms and other materials.

THREE MODELS: Narrow 30" width, 6 cu. ft. cart for easy handling and narrow runways. Standard 35" width, 6 to 8 cu. ft. carts. See your Gar-Bro dealer.

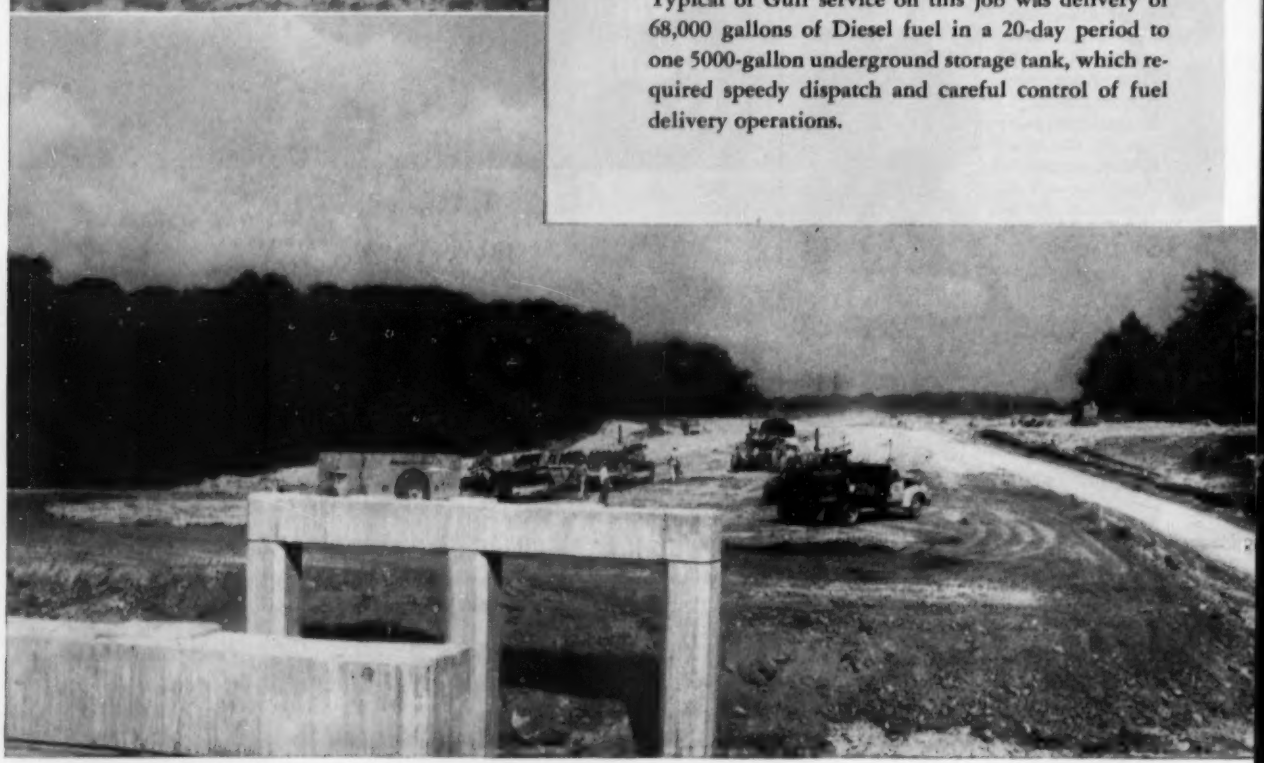
GAR-BRO MANUFACTURING CO • Los Angeles, Calif. • Peoria, Ill.
General Offices: 2415 E. Washington Blvd., Los Angeles 21, California

Ask your dealer for the Gar-Bro Manual . . .

GAR-BRO *the world's most complete line of* Concrete Handling Equipment

GULF PRODUCTS

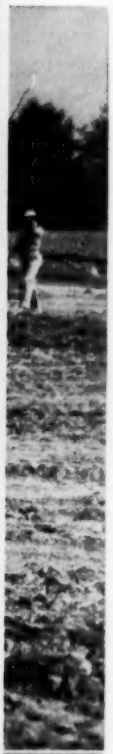
Peter Kiewit Sons' Company and Condon-Cunningham Company have the contract for Sections C-20 and C-21 of the Ohio Turnpike, which comprises 6.2 miles between Strongsville and Olmsted Falls, Ohio. Work involves moving over 1,000,000 cubic yards of dirt, with extremely poor soil conditions. Typical of Gulf service on this job was delivery of 68,000 gallons of Diesel fuel in a 20-day period to one 5000-gallon underground storage tank, which required speedy dispatch and careful control of fuel delivery operations.



and FINE SERVICE

keep equipment rolling

on the Ohio Turnpike Project



The Ohio Turnpike is another huge and important project where a large percentage of the participating contractors rely on Gulf to keep their equipment operating efficiently.

Contractors like Peter Kiewit Sons' Company and Condon-Cunningham Company, for example, appreciate the clean-burning, high-performance properties of Gulf gasoline and Diesel fuels—as well as Gulf's prompt delivery service.

Let us discuss with you how Gulf quality products and fine service can help on your next job. They are quickly available to you through more than 1400 conveniently located warehouses.

GULF OIL CORPORATION · GULF REFINING COMPANY
1822 Gulf Building Pittsburgh 30, Pennsylvania

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

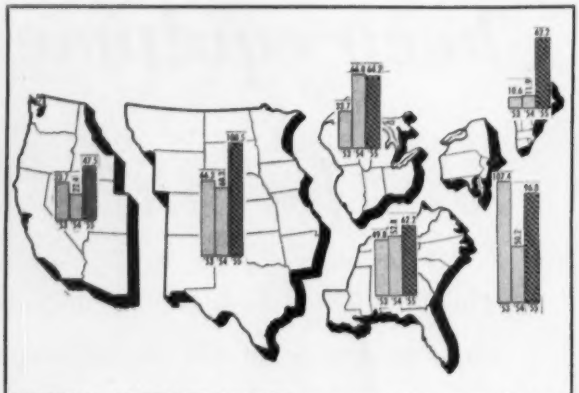
It's Your Business . . .

Record Heavy Construction Spurs Equipment Sales

SO FAR IN '55, heavy construction contracts have boomed 46% above last year and 10% higher than the previous record in 1953. With new construction business coming in at such a fast clip, contractors are rushing to get new equipment.

This is evident from the 24.4% increase over '54 in Caterpillar Tractor Co. sales during January and February '55. Similar reports from other equipment makers like Thew Shovel and Gardner-Denver indicate that sales are in a strong upturn.

Dealers report the same story, adding that deliveries of new equipment are in many cases very slow. One big equipment dealer in New York had the biggest January-February sales in years, far above the usual low volume during these months, and the trend continues. He reports that delivery waits are now running about four months. Other equipment distributors in the New York-New Jersey metropolitan areas report sales are going well or better than usual. Most of them echo the slowdown in deliveries, and have large backlogs. Some expect the delivery situation to get worse. From Baltimore, a dealer reports demand has been heavy since the fourth quarter of '54 and that new equipment is very slow in coming through from the factory.



HIGHWAY CONTRACT AWARDS set a new first quarter high of $443 million in '55. The chart shows how awards were up from a year ago in all regions of the country except the Middle West. However, contracts in that region were only slightly below the '54 level. Biggest increase in highway construction so far in '55 is in New England with first quarter contracts more than five times the year-ago volume.

Contractor on the Spot

The slow deliveries may put contractors on the spot this year. The sharp decline in equipment purchases last year indicates that much equipment buying might have been deferred until business improved. But now, with the equipment pipelines jammed up, some contractors may be hurt. Delayed deliveries of new equipment could upset their construction schedule and result in penalties. A steel strike, if it does develop, could complicate the situation later on this year.

While there is the possibility of used equipment filling in the gap, it's not competitive with new rigs which have been designed for greater efficiency and performance. Contractors face another intensely competitive year in '55, even though the volume of work available has increased greatly. They just can't afford to put themselves at any competitive disadvantage.

Sellers' Market May Mean Smaller Trade-in Allowances

Used equipment sales are reported slow by four of the six dealers checked in the New York-New Jersey metropolitan area. This includes rigs in good condition. Only one dealer reports his used equipment sales, particularly cranes and shovels, are going well. However, his used tractors are not selling. Continuing slow deliveries on new equipment could change this picture.

One dealer blames the backing up in used equipment on the unusually high trade-ins allowed by competing dealers during the 1954 period of sagging sales. Now they are reluctant to sell the used equipment for what they can get, because it means taking too big a loss.

Today, it looks like a sellers' market may be replacing the buyers' market for new equipment. In fact, this has already happened, according to one large New York distributor. If so, it could mean the end of those fat trade-in allowances on used equipment.

Flood of New Proposed Work Should Keep Business Rolling

The record rate of contract awards is backed up by the second largest volume of proposed work in history. Heavy construction projects estimated to cost a total of $5.7 billion were proposed during the first quarter of '55, according to CM&E figures. This is the biggest first-quarter volume going into the planning stage since 1951 when the defense industrial expansion was getting under way.

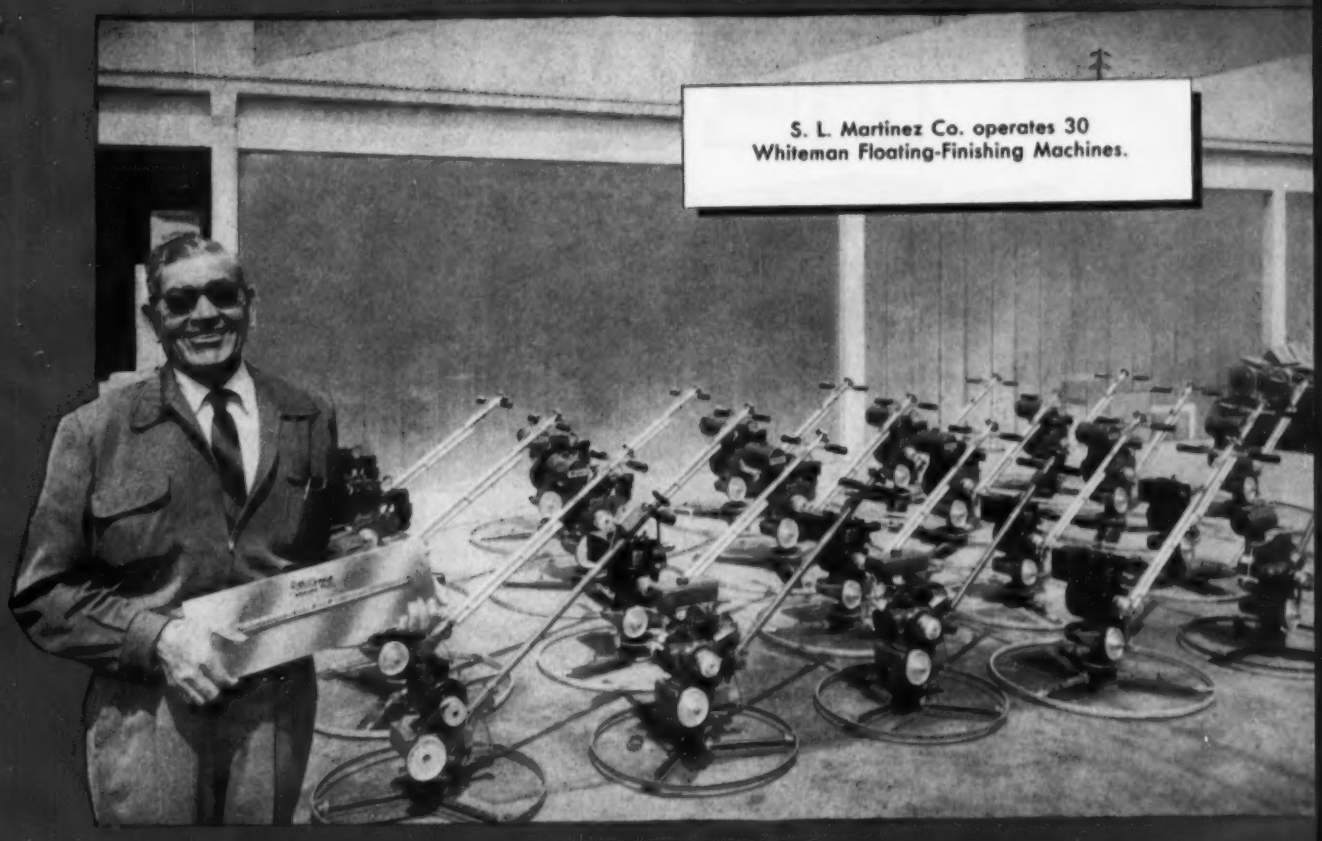
To contractors, this should be good news because it means that there's a heavy flow of new jobs shaping up for future contracts. It's hard to imagine contract volume dropping off substantially from its current level later this year or even in '56 because the backlog is piling up at such a fast rate. As of the end of March, the total backlog was a record $82.6 billion, up 9.4% over a year ago.

State and Municipal Sets New High

State and municipal projects account for most of the 44% increase over '54 in work proposed so far in '55. State and local governments proposed a record $3.2 billion in new heavy construction the biggest first-quarter on record and more than twice the value of projects they proposed during the first quarter of '54.

Massachusetts' big $1-billion, 10-yr limited access highway program accounts for a large part of the '55 state and municipal proposed work. However, even

(More Business News on page 26)



S. L. Martinez, leading concrete contractor, Los Angeles, says: **"We're getting**

400% MORE SERVICE . . .

from these

new! improved!

WHITEMAN SILVER STREAK TROWELS"

Leading contractors from coast to coast report four times more surface coverage with the new, improved Whiteman Silver Streak Floating-Finishing Machine Trowels. Made of extremely hard, durable steel, especially engineered to rigid Whiteman specifications. Designed to produce smoother, better finishing with any Whiteman Floating-Finishing Machine.

For maximum efficiency and economy, be sure to insist on Whiteman Silver Streak Trowels and genuine Whiteman parts!

Whiteman Manufacturing Co.
3249 Casitas Ave., Dept. C
Los Angeles 39, Calif.

Please send prices, literature and name of distributor for ☐ Vibrators, ☐ Screeding Machines, ☐ Power Buggies, ☐ Floating-Finishing Machines.

Name _____

Firm _____

Address _____

City _____ Zone ____ State _____

POWER BUGGIES

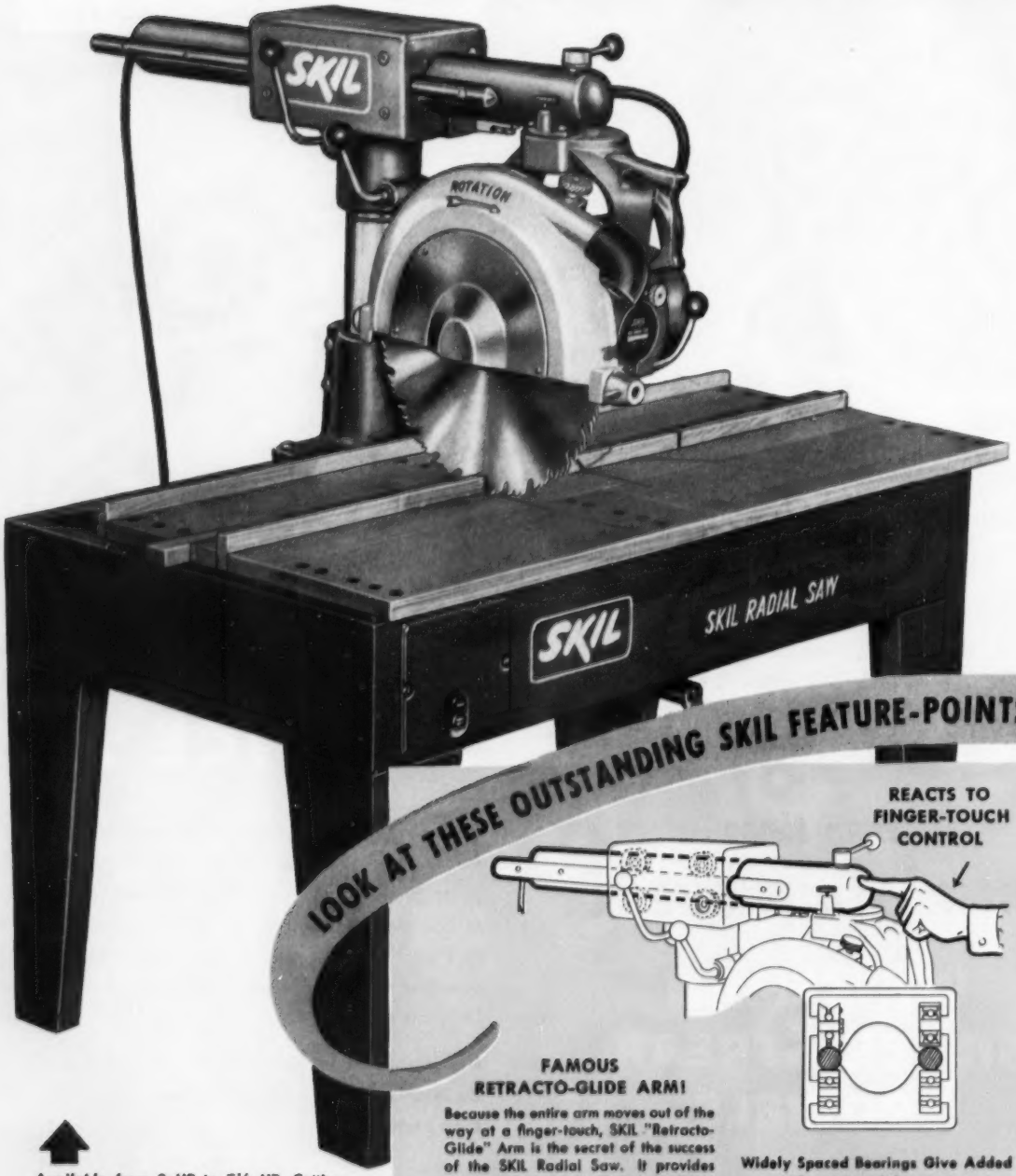
SCREEDING MACHINES

VIBRATORS

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

NEW SKIL



LOOK AT THESE OUTSTANDING SKIL FEATURE-POINTS!

FAMOUS RETRACTO-GLIDE ARM!

Because the entire arm moves out of the way at a finger-touch, SKIL "Retracto-Glide" Arm is the secret of the success of the SKIL Radial Saw. It provides clear work area at all times, uninterrupted vision of work, easy layout. Cuts set-up time, adds to safety. You can stand right up to the work on the table. And its exclusive design permits accuracy to be maintained for the life of the machine. There's nothing to equal this SKIL "Retracto-Glide" Arm for ease of operation and flexibility of use.

Widely Spaced Bearings Give Added Support and Accuracy

Eight grease-sealed ball bearings in supporting head—extra large and widely spaced. (See above.) Load glides on precision-ground, hard chromed stress-proof steel rails. Smoothest operation, for longer bearing life. Life-time rigidity, with accuracy and support unmatched by competitive saws.

Available from 2 HP to 7½ HP. Cutting capacities to 5¼". 19" cut-off capacity on 1" stock, 33" rip capacity.

25" cut-off capacity on special order at slight extra charge.

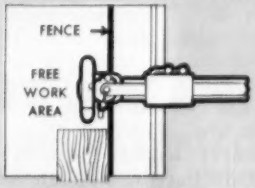
SEE YOUR SKIL DISTRIBUTOR FOR COMPLETE INFORMATION OR CALL YOUR NEAREST SKIL FACTORY BRANCH

RADIAL SAW

...with Exclusive "Retracto-Glide" Arm that Eliminates Overarm Interference!

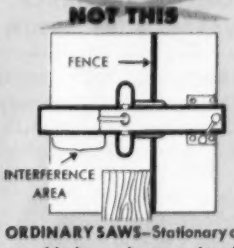
There's more efficiency, material handling speed, and safety built into this SKIL Radial Saw than any other on the market! More exclusive features to provide a clearer work area, no obstructions or interference. A broad line of radials to meet all your woodcutting needs, to eliminate all your wood (or metal) cutting bottlenecks. Check every one of these performance-proved SKIL Radial Saw engineered conveniences. There is no end to the way this remarkable SKIL product can help you.

SKIL GIVES YOU THIS



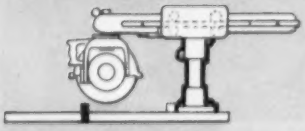
SKIL'S CLEAR WORK TABLE—Free from overarm obstruction, with plenty of layout room, more usable work area than other brand tables. Especially effective in ripping, where working the length of the table is done without overarm interference! No blind spots! No "ducking" under the overarm!

NOT THIS



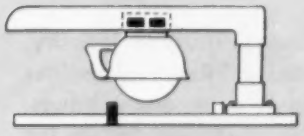
ORDINARY SAWS—Stationary overarm blocks work area, interferes with operator and vision both while laying out work and while cutting.

SKIL GIVES YOU THIS



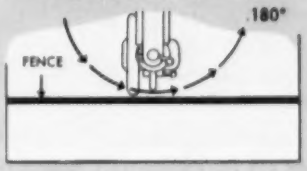
SKIL'S SUPPORTING HEAD—Bearings are spaced far apart for maximum rigidity and support. Exclusive SKIL supporting head design contains 8 double-row, sealed ball bearings, completely enclosed from pitch, abrasive dust or grit, precisely aligned, adjustable for lifetime wear.

NOT THIS



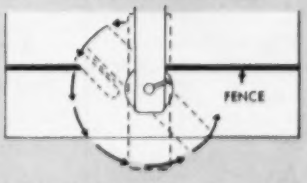
ORDINARY SAWS—Bearings closely spaced. Result: less rigidity and accuracy—faster wear because of exposure to pitch, abrasive dirt or grit.

SKIL GIVES YOU THIS

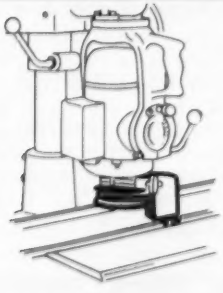


SKIL'S EASY CUT CHANGEOVER—Top convenience and ease of operation in changing from one cut to another. Because of short, 180° arc radius, the cutting head is always moved back of fence. Any cut, from 90° to 30°, right or left, is accomplished in one quick, easy step without interference with fence.

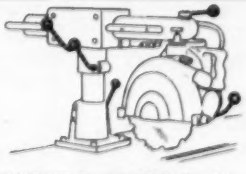
NOT THIS



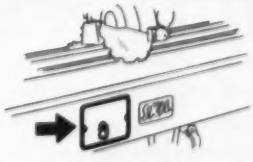
ORDINARY SAWS—To make a cut beyond 45°, it is necessary to raise the whole supporting arm and reset the saw in order to get it into position behind the fence and the work. Two operations instead of one!



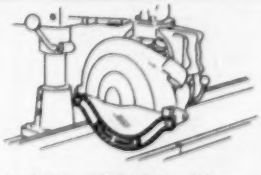
ROUTER-SHAPER ATTACHMENT—Gives more than three times the speed of competitive saws for routing and shaping work. You can handle almost any stock or custom moulding and decorative trim operation . . . on the job. Easily attached or removed. Converts your SKIL Radial Saw into a high-production router-shaper in minutes!



CONVENIENT CONTROLS—All adjustment and locking knobs placed for easy operation, quick register. Positive stops at common angles. Large, highly-visible scales.



SAFETY SWITCHES—Recessed switch control prevents accidental operation, combines easy manipulation with unusual safety and convenient location.



SAFETY GUARDS—Wrap-around upper blade guard, anti-kickback and articulated lower blade guard (latter optional at extra cost) for safest operation.

SKIL
PORTABLE TOOLS

SKIL Products are made only by SKIL Corporation formerly SKILSAW, Inc.
5033 Elston Avenue, Chicago 30, Illinois
SKIL Factory Branches in 34 Principal Cities
In Canada: Skiltools, Ltd.
3601 Dundas Street West, Toronto 9, Ontario

Mail this coupon—NOW!

SKIL Corporation, Dept. CME-55
5033 Elston Avenue, Chicago 30, Illinois

☐ Please send me free literature on SKIL Radial Saws
☐ I would like demonstration

Name_____

Address_____

City_____ Zone____ State_____

Continental Red Seal®

Rex 3½ yd. Adjusta-Wate Moto-Mixer, pouring pavement in Milwaukee. Power, Continental Red Seal F140.

means Dependable Power

In addition to its large engines, Continental builds an outstanding line of heavy-duty air-cooled four-cycle models for industrial applications requiring 2 to 3 h.p. (AU series illustrated). Advanced engineering gives them easy starting, high dependability, and unusual lugging capacity at low speeds . . .

Options: patented and exclusive Contex® external ignition system, low-level ignition cut-off, 6-1 reduction gear, and other features. Available also for use on kerosene . . . For information on these models, address Air-Cooled Industrial Engine Division, 12800 Kercheval Ave., Detroit 15, Mich.

All through the construction industry, you find Continental Red Seal engines accomplishing two important things. One is furnishing power to do the world's work; the other, building prestige for specific makes of equipment. The Red Seal line includes models engineered to a wide range of building applications, and meeting those needs completely . . . turning more and more users of mixers, pumps, compressors and other specialized machinery to makes which feature this extra-dependable power.

●

PARTS AND SERVICE FACILITIES EVERYWHERE . . . NEAR AS THE NEAREST PHONE

Continental Motors Corporation

MUSKEGON • MICHIGAN

6 EAST 45TH ST., NEW YORK 17, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 58, CALIF.
6210 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 910 S. BOSTON ST., ROOM 1008, TULSA, OKLA.
1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.

IT'S YOUR BUSINESS . . .

Continued from page 22

without this unusually large project, 40% more state and local construction was proposed so far this year than in '54.

Private Strong, Federal Lower

Private construction estimated to cost $2.4 billion piled into the backlog during the first quarter of '55. That's about the same as the volume a year ago which was 1954's biggest quarter for proposed private construction.

By contrast, federal construction is being proposed at a slower rate so far in '55. Projects going into the planning stage totaled $104 million during the first quarter, down about one-third from the year ago volume, which itself was rather low. However, the large volume of federal projects proposed during the autumn of '54 will take some time to work off. In the meantime, federal contracts are chalking up big gains so far in '55. Awards in the first 16 weeks of this year were up 82% over last year's low volume.

SOME BIG CONTRACT AWARDS OF THE MONTH

Sumner Sollitt Co., 307 N. Michigan Ave., Chicago 1, Ill. Four apartments Lakeshore Drive and Diversey Blvd., and two on Lakeshore Drive and Walton St., Chicago, Ill. for Herbert S. Greenwald, 135 S. La Salle St., Chicago 3, Ill. $15,000,000 and $10,000,000 respectively.

Walsh Construction Co., B. Perini & Sons, Morrison-Knudsen Co., Peter Kiewit Sons Co. and **Utah Construction Co.,** 122 E. 42nd St., New York 17, N. Y. Construction of Long Sault Dam near Massena, St. Lawrence Co. for the Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. $25,972,033.

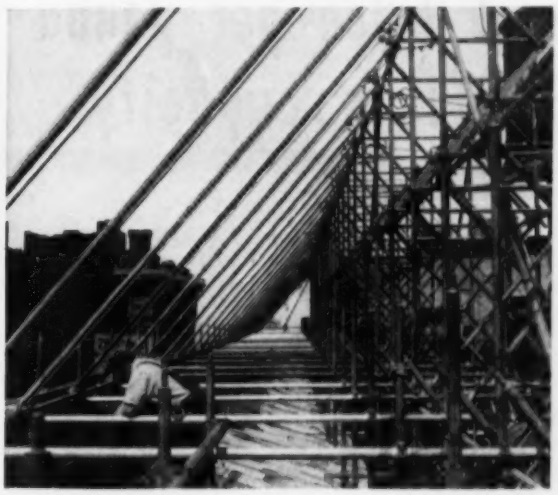
Stone & Webster Engineering Corp., 1403 Roseneath Rd., Richmond, Va. Design and construct steam generating power plant on York River near Yorktown and adjacent to American Oil refinery, steam turbine generators, Hornsbyville, Va. for Virginia Electric & Power Co., 7th and Franklin Sts., Richmond, Va. $20,000,000.

(More Big Jobs on page 30)

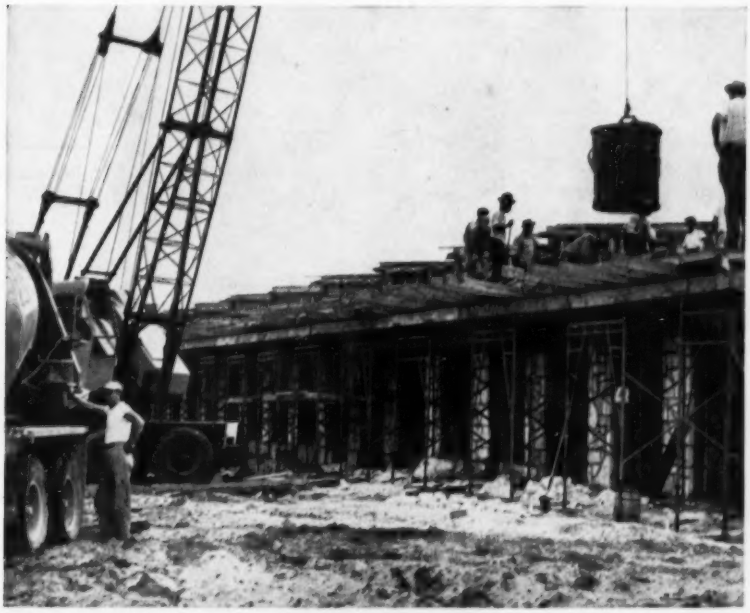
(Advertisement)

Scaffolding Methods . . . by Patent Scaffolding Co.

WITHIN EASY REACH—Separate 20"-wide platform, laid on sidewall brackets attached to "Trouble Saver"® Sectional Steel Scaffold, keeps materials easy to reach and men at most convenient working level. General contractor Damon G. Douglas uses this equipment for new elevator shaft at Hyatt Roller Bearing plant in Harrison, N. J.



OVER AND OUT—To remove cornice stones on an 18-story New York City building without disturbing a 6-ft. parapet wall, J. H. Taylor Construction Co. uses "TubeLox"® tube and coupler Scaffolding and cantilevered it 6 ft. beyond the wall. Steel cables, supporting a hanging, two-level "TubeLox" Scaffold below the cornice, run up over the framework and are anchored to the roof.



CONCRETE SHORING—Forms for the entire roof and all girders on the Northwest Dade Junior High School, Miami, are shored with 5'-wide "Trouble Saver" end frames, varying in height from 3' to 6'6". U-heads and extension legs in frame legs speed the installation of stringers. Thompson-Polizzi Construction Co., Miami, is the general contractor on this project. "Trouble Saver" Shoring, in addition to cutting shoring costs, provides a ready-made scaffold for stripping of forms or removing pans.

SEATTLE STONE—Four-story addition to the Bon Marche building in Seattle is faced with local cast stone by Bennett Campbell, Inc., general contractor. 88 6'6"-wide "Gold Medal"® Suspended Machines are used to scaffold two sides at a time.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that sells and rents "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street Dept. CM&E Long Island City 1, N. Y.
***West Coast:* 6931 Stanford Ave., Los Angeles 1, Calif.**
Branches in all principal cities
In Canada: 355 Dufferin St., Toronto

Check price per pound of lifting capacity

There is a very quick way to determine which crane or excavator offers you biggest production capacity per dollar of equipment investment. Compare machines on the basis of price per pound of lifting capacity.

Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength and stability to handle bigger dragline and clamshell buckets on a wider work range — more power and speed to increase shovel and hoe production.

Check the Koehring lift ratings shown below — then ask your Koehring distributor to show you the figures on price per pound of lifting capacity.

compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request—ask your Koehring distributor to see them.

KOEHRING COMPANY Milwaukee 16, Wis.
Subsidiaries: JOHNSON
PARSONS · KWIK-MIX

— with hand tools on the job or in the shop?

Porter hand power cutters cut up to and including

3/4" bolts — hard or soft
3/4" chain
5/8" rod
3/4" wire rope
as well as steel strapping, insulated cable, spring wire, etc.

SEND for this book which shows materials to be cut and cost comparisons between cutting methods. It may save you money.

H. K. PORTER, INC.
Somerville 43, Mass.

Please send me my copy of
"CUTTING METALS THE EASY WAY".

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE _____

MY DISTRIBUTOR IS _____

BIG JOBS OF THE MONTH . . .

Continued from page 26

Combustion Engineering Co., 200 Madison Ave., New York 16. Boiler for expansion of Huntley steam-electric generating station in nearby Tonawanda, Buffalo, N.Y., for Niagara Mohawk Power Corp., 300 Erie Blvd. W., Syracuse, N.Y. $30,000,000.

Utah Construction Co., 100 Bush St., San Francisco, Calif. and Bates & Rogers Construction Co., 600 W. Jackson St., Chicago, Ill. Driving 24-ft dia tunnel 6¾ mi for Poe hydroelectric project on Feather River, Calif. for Pacific Gas & Electric Co., 445 Sutter St., San Francisco, Calif. $35,000,000.

The Lane Construction Corp., PO Drawer 911, Meriden, Conn. Highway and bridge construction, Westfield and West Springfield, Mass. for the Massachusetts Turnpike Authority, 80 Boylston St., Boston. $6,000,000.

Reid Contracting Co., 23 Main St., Woodbridge, N. J. Grading, drainage, paving, structures in connection with widening New Jersey Turnpike connection to north of Cranbury-South River Road, Burlington, Mercer and Middlesex counties for New Jersey Turnpike Authority, Administration Bldg., New Brunswick. $7,303,387.

Melvin H. Glick & Co., 44 N. Brentwood Blvd., Clayton 5, Mo. Subdivision development, 1,000 residences, supermarket shopping center and parking area on 300-acre tract north side of Olive St. Road, east of Lindbergh Blvd. for Isidor Shank, 2 S. Brentwood Blvd., Clayton 5, Mo. $20,000,000.

Bechtel Corp., 220 Bush St., San Francisco, Calif. 800-mi oil pipe line between El Paso, Tex. and Los Angeles, Calif. through Texas, New Mexico, Arizona and California for Southern Pacific Pipe Lines Inc. (Southern Pacific Ry., parent owners) 913 Franklin St., Houston, Tex. $30,000,000.

Johnson, Drake & Piper, 1138 Baker Bldg., Minneapolis, Minn. Main section of Southdale shopping center, 66th and France Ave., South, Edina (Minneapolis) Minn. for the Dayton Co. Seventh St. and Nicollet Ave. and L. S. Donaldson Co. 601 Nicollet Ave., Minneapolis. $7,048,000.

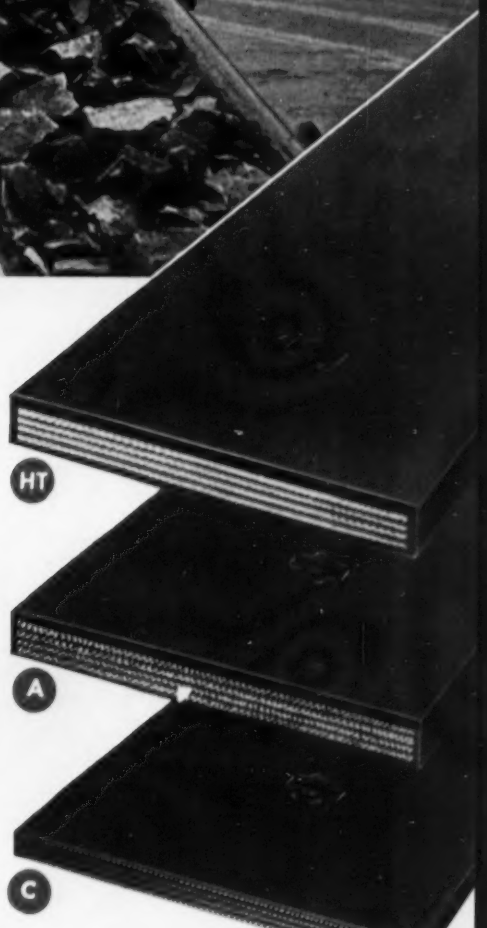
(More Big Jobs on page 224)

Thermoid Conveyor Belting cuts handling costs on every construction job

Thermoid Industrial Rubber Products — Quality — Service

There's a Thermoid Conveyor Belt designed to lower your handling costs on every construction job. Here are three examples: (HT) For extremely abrasive materials such as granite, trap rock, flint rock, quartz ore; (A) For slag, lime rock, crushed stone and other highly abrasive materials; (C) For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. There is a complete line of Thermoid Conveyor Belting, Hose and Multi-V Belts for every construction application. Call your Thermoid Distributor for information, or write direct.

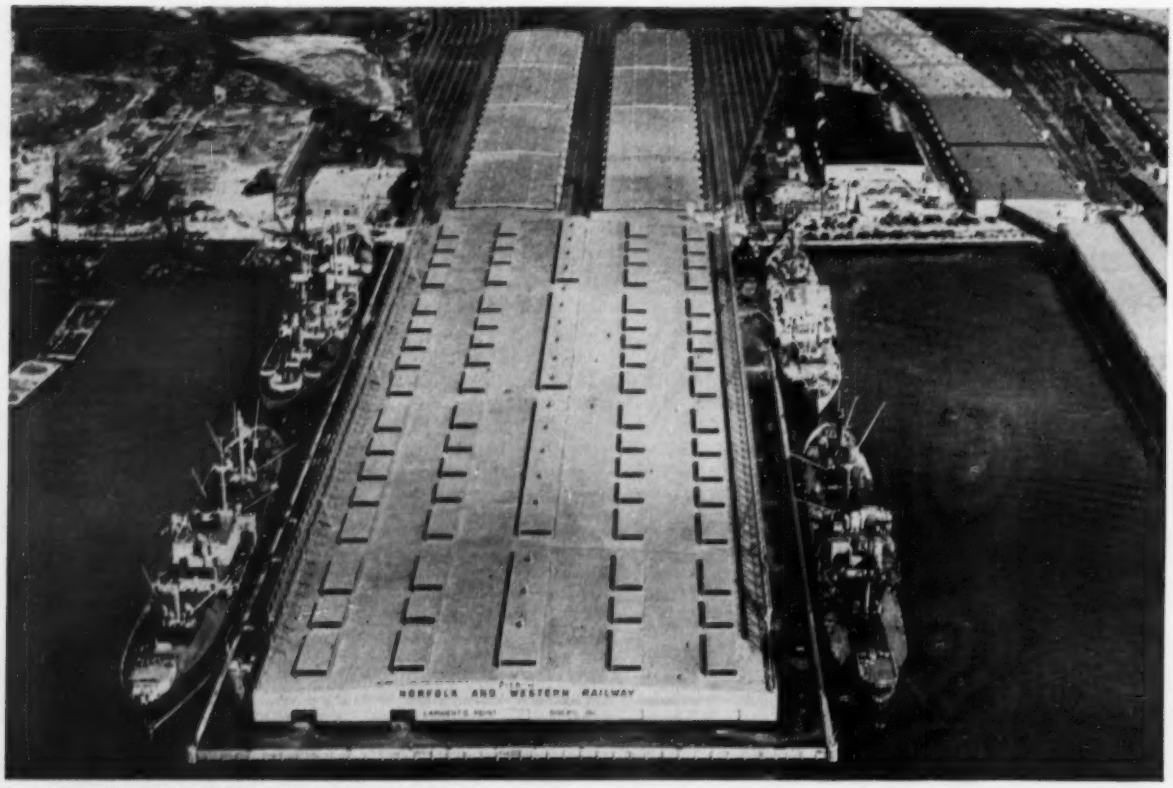


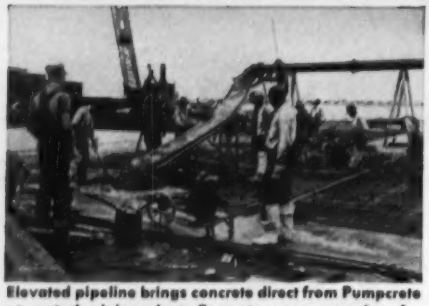
Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah





Elevated pipeline brings concrete direct from Pumpcrete at central mixing plant. Concrete was pumped as far as 1500 feet for pier deck. Concrete for pier deck alone totaled 24,246 cu. yd.

Concrete piles were formed in this casting yard behind the pier. Concrete was delivered through pipeline directly into hoppers. A third pipeline was also run to the land warehouses for placing foundations and floors.

Pumpcrete® places concrete for largest single-deck pier on Atlantic seaboard!

70 miles of precast piles under 10 acres of concrete deck!

A concrete and engineering triumph, Norfolk and Western Railway's new, modern pier at Lambert Point, Norfolk, Va., contains 70 miles of precast piles under a 10-acre concrete deck. And it was all placed by Pumpcrete...the pump that delivers concrete by pipeline!

Pumpcrete was also used to place foundations and floors for two land warehouses behind the pier. Three separate pipelines were used from Pumpcrete located next to a unique central mixing plant. One delivered concrete to the pile casting yard, another to the pier and a third to the land warehouses.

By simply changing lines, Pumpcrete delivered concrete immediately to any one of the work areas. And being located right with the mixing plant, concrete was discharged directly into Pumpcrete—thus eliminating additional hauling equipment.

This is another example why Pumpcrete is being used more and more to save time, eliminate expensive hauling equipment and deliver better concrete faster. Look into Pumpcrete's advantages for your next job—you'll be glad you did! See your local Rex Distributor or write: CHAIN Belt Company, 4664 W. Greenfield Ave., Milwaukee 1, Wisconsin.

CONSTRUCTION REX MACHINERY

CHAIN BELT COMPANY

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

ALLIS-CHALMERS PRESENTS TWO NEW, POWERFUL DIRT MOVERS

...meeting the stepped-up needs of the construction industry for more power...better performance...longer life!

the HD-21

204 net engine hp
44,000 lb

Introducing

- **A Great New Power Team with New Allis-Chalmers Diesel Engine and Advanced Design Torque Converter!**
- **20% Greater Over-all Tractor Performance!**
- **New Durability Clear Through!**

the TS-360 MOTOR SCRAPER

280 hp
20-yd capacity

- **Higher Standards of Production!**
- **New Long-Life Strength!**
- **More Operator Advantages!**
- **New Design, Construction and Service Simplicity!**

Bigger-better! Tested-proved! READY NOW!

ALLIS-CHALMERS PRESENTS TWO NEW, POWERFUL DIRT MOVERS

...meeting the stepped-up needs of the construction industry for more power...better performance...longer life!

the **HD-21**

204 net engine hp
44,000 lb

Introducing

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280 hp
20-yd capacity

- Higher Standards of Production!
- New Long-Life Strength!
- More Operator Advantages!
- New Design, Construction and Service Simplicity!

Bigger-better!
Tested-proved!
READY NOW!

NEW BIG-YARDAGE WORK CAPACITY

Power that pays The TS-360's great new Allis-Chalmers engine spearheads a whole new power train that offers more rim pull at all speeds for better loading, hauling and spreading performance . . . faster acceleration, easy shifting and quick getaways. Combined with new 20-yd capacity, this all adds up to fast, high-volume, high-profit work cycles.

New operating ease and safety In addition to big-job power and gearing, the TS-360 Motor Scraper offers everything an operator needs to work easily, yet efficiently . . . new Double-Safety air brakes, new selective steering, direct electric starting, new multiple-disc cable control . . . and many others you'll want to know more about.

Strength to back it up! The new TS-360 is built around a new, all-welded, heavy steel main frame that makes possible the service accessibility of unit construction. What's more, there's an all-new final drive gear train, with new gears, shafts and bearings. These and many other advantages mean more work done, lower maintenance cost and longer equipment life.

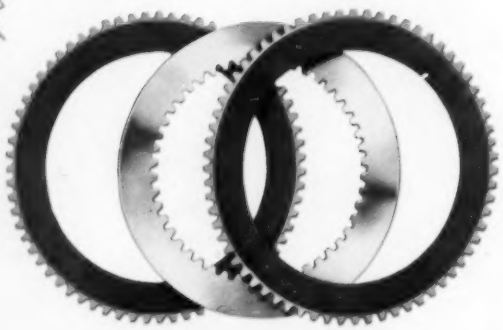
ALLIS-CHALMERS

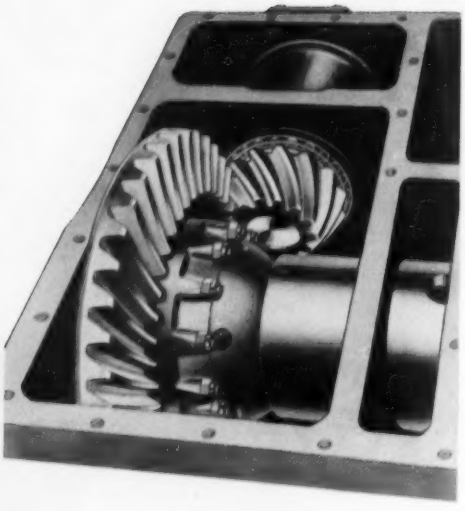
TS-360

The inside facts

New multiple-disc cable control

With a new safeguard switch that automatically stops cable travel at maximum lift . . . prevents cable shock, increases cable life.





NEW . . . FR

New heavy-duty gears

The TS-360's ring, pinion, differential and final drive gears are completely new in design and weight to produce new standards of strength and durability.

ALLIS-CHALMERS

TS-360

MOTOR SCRAPER

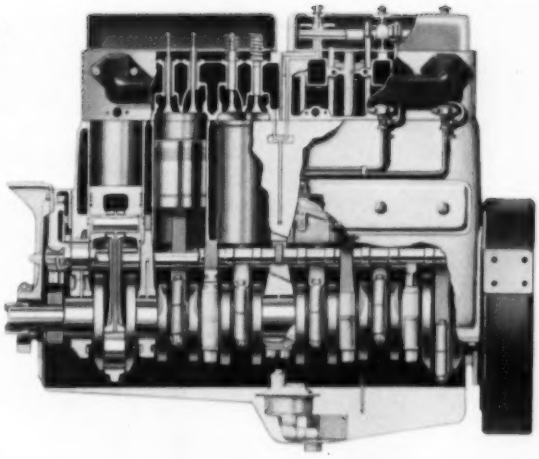
New operator comfort

Plenty of leg room, convenient control, no fan blast, conning tower visibility.

Now

New high-torque Allis-Chalmers engine

Here's an 844-cu-in. power plant that delivers smooth power over a wide range of speeds . . . with plenty in reserve to assure real dependability and low operating cost.

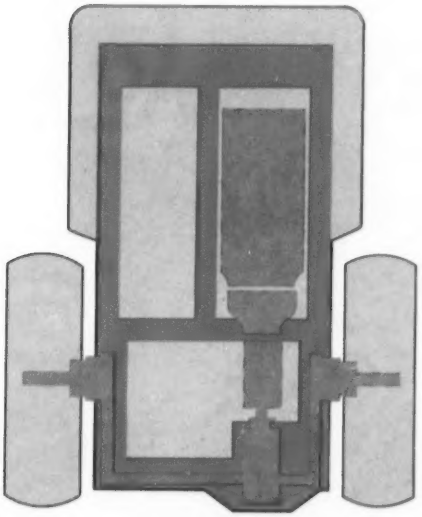


New direct electric starting

Provides easy, all-weather starting with a turn of the key.

RONT TO BACK

Built to outperform!



SPECIFICATIONS		
CAPACITY	Struck, cu yd—15 Heaped, cu yd—20	
SPEEDS mph at 2100 rpm	First	3.0
	Second	6.1
	Third	11.3
	Fourth	20.0
	Reverse	3.1
WEIGHT	49,000 lb	

New serviceability

With its new main frame, the TS-360 offers the simplicity of unit construction... easy removal and servicing of both major and minor assemblies.

New double-safety air brakes

Assure ample braking pressure at all times.

New selective steering

Provides a controlled flow system for easy maneuverability in tough going . . . fine control for safe, high-speed steering on the haul road.

New low-mounted headlights

Insure maximum road illumination for nighttime operations. Sealed Beam lights easily adjustable to any position.

Nowhere can you match these two . . .

NEW BIG-YARDAGE WORK CAPACITY

Power that pays The TS-360's great new Allis-Chalmers engine spearheads a whole new power train that offers more rim pull at all speeds for better loading, hauling and spreading performance . . . faster acceleration, easy shifting and quick getaways. Combined with new 20-yd capacity, this all adds up to fast, high-volume, high-profit work cycles.

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ALLIS-CHALMERS

TS-360

SPECIFICATIONS

The inside facts

BIGGEST MOST POWERFUL CRAWLER IN PRODUCTION...ANYWHERE!

New standards of output The HD-21 introduces the new Allis-Chalmers engine and a great new power transmission team. Together, they provide extra speed with any load, extra pulling power at any speed . . . wider speed ranges and more range overlap. And with its advanced design torque converter (*the result of 15 years of experience by Allis-Chalmers*) the HD-21 puts its power to work with less shifting than ever before possible . . . to help you reach a new high in efficient, profitable production!

New standards of durability From the new Allis-Chalmers diesel with "follow-through" combustion to new, heavier Tru-Dimension track, the HD-21 is built to take today's big loads in stride, and come back for more. Here are just a few more of the long-life features you can't get from anyone but Allis-Chalmers . . . at any price: all-steel Box-A main frame, straddle-mounted final drive gears, 1,000-hour truck wheel lubrication, oil-enclosed track release mechanism.

New low cost per unit of work The HD-21's outstanding performance and durability provide a new measure of tractor value. Add the *planned* approach to service offered by Allis-Chalmers dealers, and it's the ideal team for men tackling today's *big* jobs.

SPECIFICATIONS

ALLIS-CHALMERS

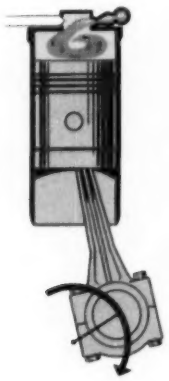
HD-21

The inside facts

New "wrap-around" radiator guards

The cost of mounting bulldozers is reduced because hydraulic rams or cable-lift sheaves mount directly on new "wrap-around" guard. For easy service accessibility, guard tilts forward.

New Allis



NEW...FROM TRACK

Built to outlast all others!

SPECIFICATIONS

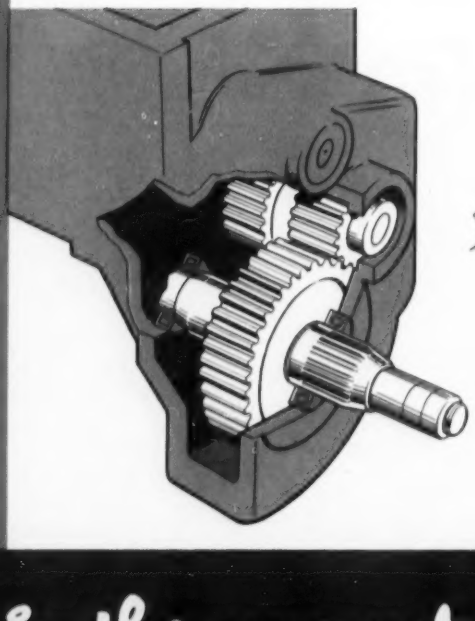
WEIGHT 44,000 lb
204 flywheel hp

SPEEDS

Gear Range	Speed mph
Low	0–3.0
High	0–7.5
Reverse	0–5.5

New True-Dimension track

New in design, heavier and stronger . . . plus new advances in wearability. New heat-treating methods permit achieving optimum hardness throughout the track sidebar for maximum wearability and toughness . . . longer life, more time on the job.



New, heavy straddle-mounted final drives

Provide ample strength for today's bigger mounted equipment, bigger loads. And the HD-21's entire final drive assembly rides in a rigid, one-piece steel case, with *all* gears straddle-mounted on tapered roller bearings to insure better performance, longer life.

A host of new features

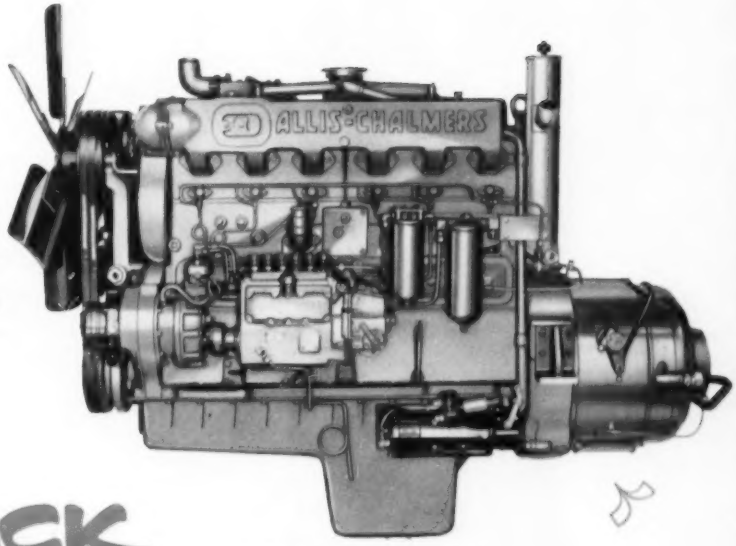
Heavyweight front idlers and truck wh
high-capacity cooling system . . . separ
exchanger for torque converter . . . stre
main frame . . . heavy-duty 135-gal fue
foam rubber seats and arm rests . . . m

. . . in the amount of work they do!

ew Allis-Chalmers engine

Brings you top performance, extra-long life through a new kind of "follow-through" combustion. Here's why—

The key explosion occurs in the energy cell as shown, unleashing a blast that sets up cyclone turbulence. Result—no damaging peak pressures . . . instead, higher average and sustained working pressures and more effective leverage on the crankshaft. *Be sure to ask your Allis-Chalmers dealer for the visual story revealing the full advantages of this new engine.*



CK TO STACK

ers!

Great new engine-torque converter-transmission team

The new Allis-Chalmers engine's characteristics combine with the HD-21 torque converter to produce a new kind of high-output performance. Combined with a new transmission, it brings you closer to complete elimination of shifting than ever thought possible.

The HD-21 will do *20 percent more work* . . . give you lower cost per unit of work and higher profit. And your operators will never have it so easy!

ALLIS-CHALMERS
HD-21
DIESEL TRACTOR

ounted
ntire
e
n

ures

d truck wheels . . .
. . . separate heat
ter . . . stress-relieved
135-gal fuel tank . . .
ests . . . many others.

o!

The new HD-21 and TS-360 are

BACKED BY ALLIS-CHALMERS DEALER SERVICE PLAN

Yes, your Allis-Chalmers dealer offers you original factory parts for both the HD-21 and TS-360 . . . plus a *planned* approach to service, right from the day equipment is delivered. It covers factory service schools, in-the-field lubrication schedules, operating tips and preventive maintenance.

You owe it to yourself to take full advantage of the Allis-Chalmers Dealer Service Plan to keep your equipment operating efficiently. Experience *proves* that it pays big dividends.

FIELD UNITS TO SPAN THE NATION

Specially-equipped trucks from the Allis-Chalmers Training Center, Springfield, Illinois, are on their way to the field *now*, as a special service backing up the introduction of the HD-21 and TS-360. First trips will bring factory specialists to locations all over the country to present the story on these great new dirt movers and their service advantages.

For all the facts on when one of the Field Units will be in your vicinity . . . plus full information on planned service, see your nearby Allis-Chalmers dealer.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

AS661-5503

Printed in U. S. A.

(Advertisement)

Jaeger "125" compressor, above, simultaneously powered both tools. Photo at right shows section of trench in which up to 7' of limestone had to be removed. Rock is being drilled with light sinker while heavy breaker is shaping up bottom level of trench. Alfa Construction Co., Pittsburgh, Pa., Contractor.

Jaeger "125" does this work 40% faster

Drilling rock bottom at rock bottom cost

FREQUENT LIMESTONE DEPOSITS up to 7' thick were encountered in excavating approximately 10 miles of trench on this Palmyra, Pennsylvania, sewer extension. To prepare for blasting, 1½ inch holes were drilled to 4' with a light sinker, and a heavy breaker was used for shaping up. Both tools were operated simultaneously by a new standard Jaeger "125" compressor.

Because the Jaeger "125" has enough air volume to keep both tools at full pressure, hitting with maximum frequency and impact, *this part of the job was done at least 40% faster than had a 105 ft. compressor been used.*

The Jaeger "125" is the most efficient general purpose compressor you can buy. It is engineered to produce 125 cfm at 100 psi at the lowest cost per cubic foot of air. The Jaeger "75" is equally well suited for operating a single heavy-duty or two light-duty breakers at full efficiency, which 60 ft. compressors cannot do.

Ask your Jaeger distributor to show you what you can save on air and air tool operation, or write today for Bulletin C75-1 giving complete information.

Jaeger Standards:	**75**	**125**	**185**	**250**	**365**	**600**
Old Standards:	60	105	160	210	315	500

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • LOADERS • PAVING MACHINES

M5661-5503

Printed in U. S. A.

PICTURE OF THE MONTH

CONSTRUCTION METHODS AND EQUIPMENT

Inside Hoist Gets Outside Lift

UP ALONGSIDE the gleaming aluminum and limestone facade of the tallest skyscraper in Chicago, the nearly completed 41-story Prudential Building, goes one of 10 Otis elevator hoisting motors. Each hoisting machine weighs 13 tons and will power tower elevators operating above the 28th floor. The building will have 12 moving electric stairs, 27 passenger and 3 freight elevators. The elevators, of the new operatorless type, will have speeds of 1,400 fpm. General contractor on the project is George A. Fuller Co.

Here's proof that Gradalls pay off!

47% OF ALL GRADALL SALES ARE REPEAT SALES!

No cost-conscious equipment buyer buys a second machine unless the first one he owns really pays off!

And the best evidence that the Gradall *is* a real cost-cutter is the fact that almost *half* the Gradalls sold go to present owners of these multi-purpose machines. Contractors, large and small, cities and towns, county and state highway departments, turnpike commissions, utilities, irrigation authorities, railroads, industrial companies, government agencies all own two or more Gradalls! A Gradall owner invariably *wants* more.

Why? Simply because no other single machine does so many *different* jobs so well. Gradalls handle jobs no other machine can touch. Gradall's arm-action accuracy eliminates costly hand labor on "hand-finish" jobs. Gradall is always ready to speed to the *next* job, carrying its own quickly interchangeable attachments for any work ahead. Owners get more on-the-job hours from Gradalls every week the year round.

Get in on the Gradall pay-off yourself! Before you invest in any earth-moving equipment, see a Gradall in action. Arrange a field demonstration now with your nearest Gradall Distributor.

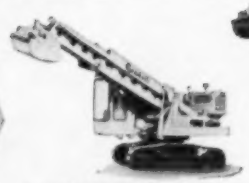
Gradall Distributors in over 75 principal cities in the United States and Canada

CONTRACTORS *like Arnolt Bros., Inc. have proved Gradall a real money-maker. This Metuchen, N. J. contractor bought first Gradall in 1952, now owns 8 Gradalls – and wants more.*

COUNTIES, STATES, MUNICIPALITIES *keep buying more and more Gradalls. Harris County, Texas, now owns 12 Gradalls to lead this classification of multi-machine owners.*

MORE SPECIALIZED OWNERS, *like irrigation authorities, industry, railroads, utilities and others, make the most of Gradall's versatility. One eastern railroad now owns 19 machines.*

NOW ALSO AVAILABLE



CRAWLER-MOUNTED GRADALL

SELF-PROPELLED GRADALL

RAILROAD GRADALL

Gradall
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

(Advertisement)

TWO MILLION TONS OF ROCK QUARRIED AT LITTLE ADEN FOR NEW HARBOUR . . . . .

Constructed for The British Petroleum Company Ltd. (formerly Anglo-Iranian Oil Company) at a cost of £8 million—from the volcanic rock face which dominates the natural harbour, the port of Little Aden is designed to provide essential harbour facilities for the world's largest oil-tankers.

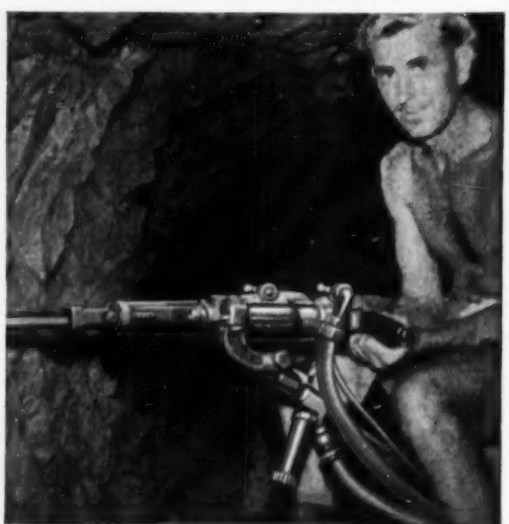
A major feature of this vast project was the extensive quarrying. The average tonnage produced per week being 30,000 tons. This production is far in excess of the output of any established British quarry—and includes initial quarrying development time. Atlas Copco pusher leg drills with 'Sandvik Coromant' steels were used for the drilling operations.

2 to 5-ton rock—the top surface of the breakwater preparatory to construction of concrete road.

'SANDVIK COROMANT' THE WORLD'S MOST WIDELY USED INSERT BIT DRILL STEELS. At the drilling end of the Atlas Copco equipment employed on the Little Aden project were 'Sandvik Coromant' tungsten-carbide-tipped drill steels. As can well be imagined, smooth, trouble-free progress during drilling operations depends largely on their efficiency. Sandvik are the world's only manufacturers controlling every phase of production—from the mining of wolfram ore to the final tungsten-carbide-tipped steels. This 'under-one-roof' policy of Sandvik has given mining and drilling engineers steels of never-varying quality; steels which have brought faster speeds and new economies to drilling. The production of Sandvik Coromant drill steels and their extra-hard tungsten-carbide tips is not only strictly controlled, but influenced by essential background information. This is provided by a rock-drilling laboratory at Sandvik's own test mine; research teams at their factories in Sweden, South Africa and Canada; the completion of hundreds of miles of test drilling yearly in close co-operation with Atlas Copco.

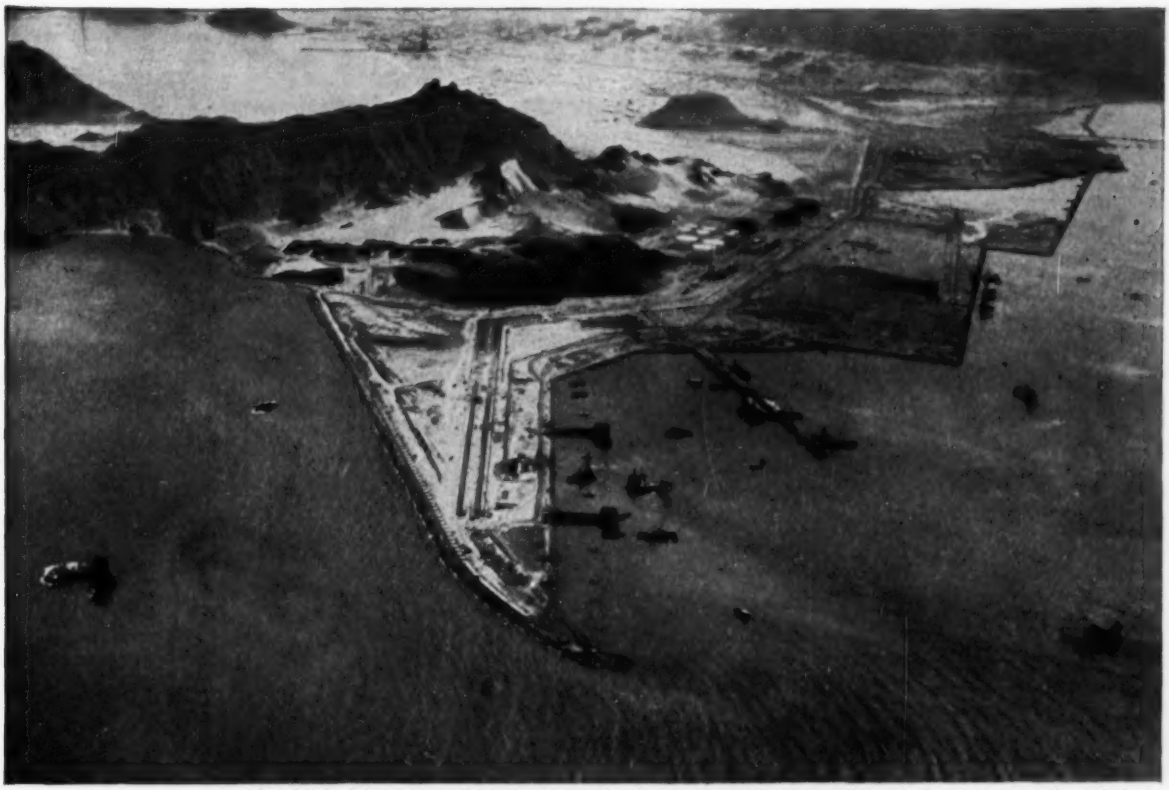
EXTENT OF THE PROJECT. The Little Aden harbour project necessitated large-scale quarrying in order to obtain sufficient rock for the construction of a breakwater 4,300 ft. long to protect the new oil-harbour, and for a rock bund 9,500 ft. long to contain an area of 200 acres reclaimed with sand dredged from the harbour site. In addition, approximately 500,000 cubic yards of rock were needed for roads, embankments, crushers and other works.

METHOD OF QUARRYING. Four main quarries were operated. In nearly every case the rock mass presented an awkward profile for development and open quarrying with hand drills was necessary to develop the faces. Several methods were used; benching with jack-hammers and wagon drills, well-hole drilling and heading blasting. Of these, heading blasting proved the most successful, both from the point of view of production and rock size. As a result, nearly all the 2,000,000 tons of rock required for the project were quarried in this way.



Rock drill in operation at the face.

(Advertisement)



Aerial view of the harbour and breakwater at Little Aden, showing in the background the rock-faces where quarrying took place.

DRILLING WITH ATLAS COPCO EQUIPMENT USING SANDVIK COROMANT DRILL STEELS

ATLAS COPCO EXPERIENCE AND SERVICE. At Little Aden, the nature of the rock face and the extent of the drilling operations brought forth problems which naturally called for on-the-spot appreciation of the difficulties. As part of the Atlas Copco service, experts, in this case from Britain, were specially flown out to advise on drilling methods. In this way, Atlas Copco experience, gained from large-scale projects all over the world, was able to contribute to the speedy completion of the Little Aden undertaking. Atlas Copco is the world's largest exporter of rock drills and its service and experience is at the disposal of contractors everywhere.

The work was carried out by George Wimpey & Co. Ltd., contractors for the harbour works and joint contractors with Middle East Bechtel Corporation for the Refinery.

Atlas Copco Compressed Air Equipment is manufactured or sold and serviced in 48 countries throughout the world by *The Atlas Copco Group*, which embraces companies trading under various names such as Atlas, Atlas Diesel, Atlas Polar, Atlas Copco, Copco, Delfos and Sampa.

POST THE COUPON to the most convenient of the addresses given here:

U.S.A., Copco Pacific Ltd., 930 Brittan Avenue, San Carlos, California; Copco Eastern Ltd., P.O. Box 2568, Paterson 2, N.J; CANADA, Canadian Copco Ltd., Montreal, A.M.F., Quebec; MEXICO, Copco Mexicana, S.A., Apartado Postal 56, Torreon, Coahuila; PERU, Compania Atlas del Peru, S.A., Apartado 2982, Lima.

UNITED KINGDOM, The Atlas Diesel Co. Ltd., Wembley, Middx.; FRANCE, Atlas Polar S.A., 29, Rue Marbeuf, Paris 8e; HOLLAND, N.V. Holland-Atlas, P.O. Box 6056, Rotterdam; ITALY, S.A.M.P.A., Viale Marche 15, Milan.

AUSTRALIA, Australian Atlas Company Pty., Limited, P.O. Box 54, Auburn, N.S.W.; SOUTH AFRICA, Delfos (Pty.) Ltd., P.O. Box 504, Benoni, Transvaal.

Readers in countries outside those listed above and who do not know the name and address of their local Atlas Copco company or agent, please write, in the first instance, to AB Atlas Diesel, Stockholm 1, Sweden.

Please forward details of ***Atlas Copco Rock Drilling Equipment.***

NAME .....

COMPANY .....

ADDRESS .....

.....

* *I am also interested in other Atlas Copco equipment (please state which below)*

.....

* *Manufacturers of Stationary and Portable Compressors, Rock-drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment.*

THE ATLAS COPCO GROUP OF COMPANIES

Construction News in Pictures...

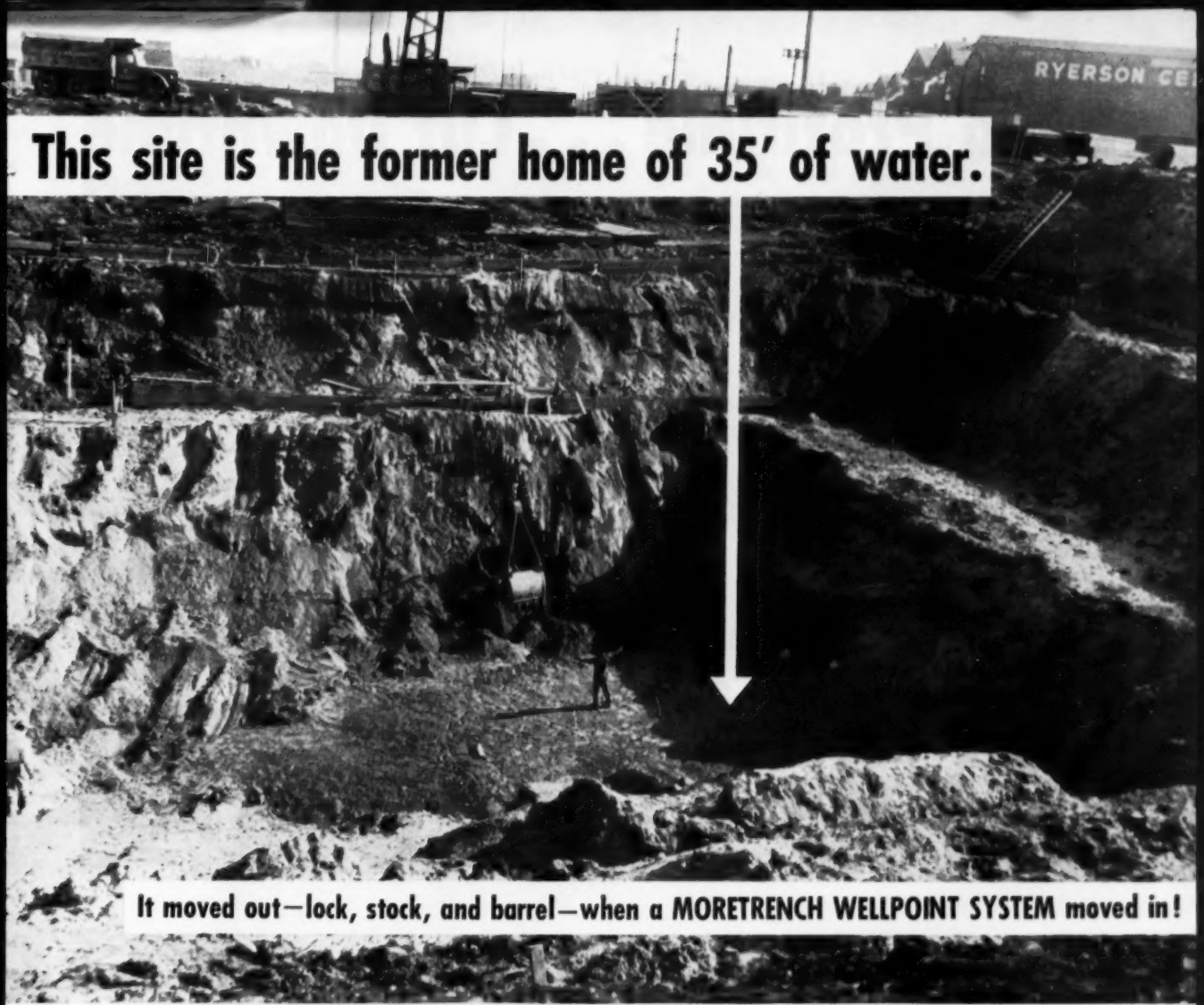
EARLY STAGES— The New York Thruway Tappen Zee bridge spanning the Hudson River wasn't very far along when this shot was taken. Construction Aggregates Inc.'s Bucyrus-Erie 22-B crane working off a barge handles floating forms and reinforcing.

THE BIG RUSH— Uranium finds are usually in inaccessible spots. Heavy construction equipment, like this bulldozer-equipped Cat D7, builds the pioneer road and then helps prepare the site for structures. This action is near Grand Junction, Colo.

(More photos on page 49)

BACK-YARD OPERATION— When Clark Equipment Co. at Benton Harbor, Mich., started to build a new 60,000-sq ft addition, they used their own Michigan machines to break ground, naturally. The Model C-24 Michigan crawler in the background excavates for setting tile, and the Michigan 175-A rubber-tired tractor-shovel helps to backfill. Contractor is The Austin Co.

This site is the former home of 35′ of water.



It moved out—lock, stock, and barrel—when a MORETRENCH WELLPOINT SYSTEM moved in!

Rapid Digging IN THE DRY Speeds Construction of Jersey City's Sewage Treatment Plant.

Garden State Constructors and Associates, Jersey City, contractors for this portion of the city's $25,000,000 sewerage project, know how quickly water can sabotage the progress of any job. That's why for quick, sure results in this mixed-up material (garbage fill, sand, silt and clay layers), they selected Moretrench to do the pumping.

When you have to deal with water, deal with Moretrench. Experienced engineers in any of our offices will be glad to analyze your problem, estimate on your requirements. The know-how of thirty years of pumping is at your disposal.

Send for Catalog

MORETRENCH CORPORATION

90 West St. New York 6 | 4900 S. Austin Ave. Chicago 38, Illinois | 7701 Interbay Blvd. Tampa 9, Florida | 315 W. 25th St. Houston 8, Texas | Rockaway New Jersey

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Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Build Profitime . . . Cut Downtime

with Firestone NYLON Off-The-Highway Tires

THAT's right! You increase yardage and profits and keep your downtime at a minimum with rugged Firestone Nylon Off-The-Highway Tires.

Whether it's earth moving, rock work or strip mining, Firestone can supply a rugged nylon tire specifically engineered for the job.

It costs you less to run on Firestone Nylon Tires because the treads give maximum traction and they are extra tough to resist cutting. The sidewalls are double thick to give added protection against cuts and snags. The new Firestone Safety-Tensioned Gum-Dipped* nylon cord body has four extra tread plies to insure longer tire life and more retreads. The Firestone Safety-Tensioned Gum-Dipped nylon body gives the greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone Nylon Off-The-Highway Tires will cut your downtime and increase your profits.

*T.M. Reg. U.S. Pat. Off.

America's Future Progress Depends on Better and Safer Highways

GROUND GRIP • ROCK GRIP • TRACTION ROCK • ALL TRACTION • ALL NON SKID • RIB EXCAVATOR

When you buy new equipment or replacement tires, specify FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

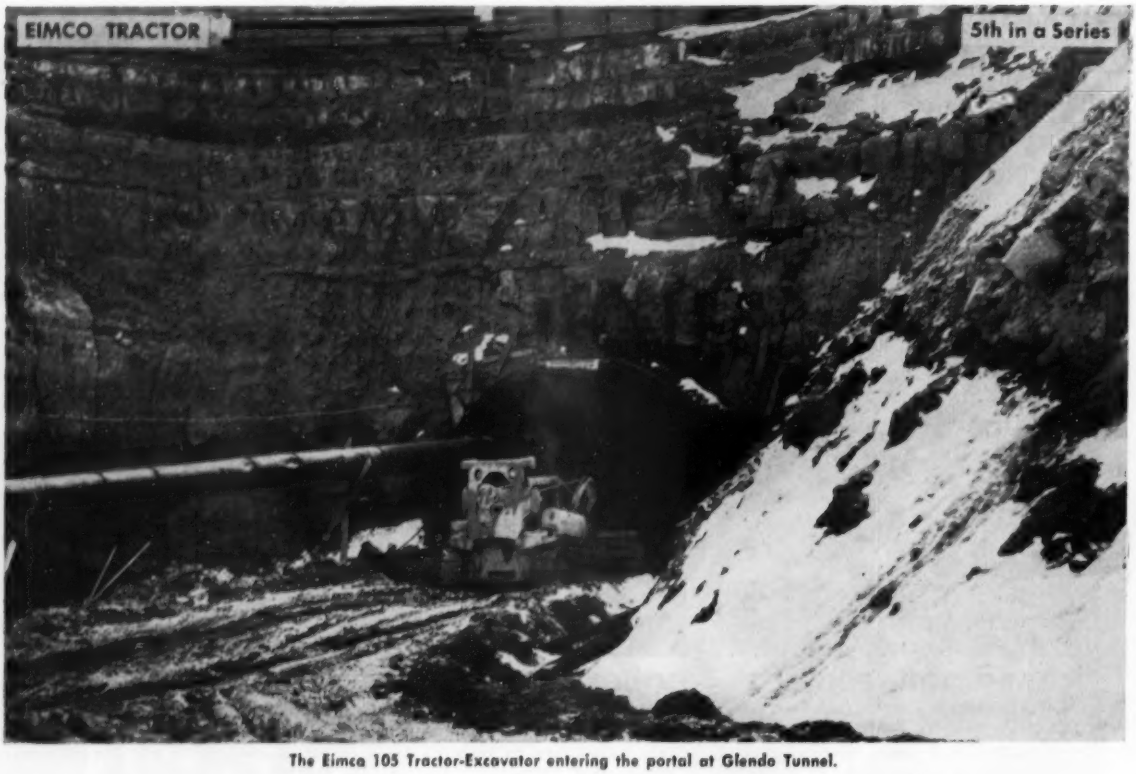
Copyright 1955, The Firestone Tire & Rubber Co.

CLASSROOM PROJECT— Senior civil engineering students from Brooklyn Polytechnic Institute get actual on-the-job experience in stress readings as they check Roebling dynamometers on suspenders of New York's Manhattan Bridge.

CONCRETE WORKHORSE— A Bucyrus-Erie 22-B transit crane, equipped with 55-ft boom and 20-ft jib extension, carries a concrete bucket while pouring a retaining wall for an all-concrete hospital building at Wolters Air Force Base, Mineral Wells, Tex. The crane will later be equipped with a longer jib and used to pour the remainder of the concrete on the three-story structure. The $225,000,000 project is being handled by J. J. Fritch Construction Co., and is scheduled for completion early in 1956.

TRAFFIC AS USUAL— General Contractor Darin & Armstrong, Detroit, Mich., had to schedule construction of this 100-ton steel conveyor bridge at the Chrysler plant so busy traffic could still flow. The 90-ft steel trusses were pre-assembled on a team track near the job and lifted into place by three cranes. A crew of 35 men required 7 hr to complete the bridge skeleton.

(Advertisement)



The Eimco 105 Tractor-Excavator entering the portal at Glendo Tunnel.

50 Feet Per Day at Glendo Tunnel

The regular day at Glendo Tunnel is two shifts. **This 21 foot circular bore, near Glendo, Wyoming, will be 2100 feet in length when completed.** All of the bore is being removed except enough bottom to provide a flat road bed for the trucks.

Water seepage, at the portal and again near the churn drill hole (approximately 1200 feet from the portal), slowed the progress of the tunnel to approximately half speed. In the dry sections, the crew was able to drill the full 10 ft. round, shoot and muck five to six rounds per two shift day with a **net gain of 50 feet of full face tunnel per day.**

Average for a complete cycle is just over three hours with 126 minutes for moving in the drill jumbo, roof bolting, drilling the face and moving out the jumbo. Fifty minutes is all that is required to load the 110-120 cubic yards of broken material with the Eimco Tractor-Excavator. **Average loading time per six cubic yard truck is 50 seconds.**

Roof bolting is done off the top of the jumbo as soon as the rig is moved to the face.

The Eimco 105 Tractor.

Average time required to load 6 cubic yard Dumptors is 50 seconds.

The Eimco is also used in the fill area during the drilling cycle to keep the fill level.

The Eimco Tractor is preferred equipment on tunnel, general construction jobs and any other work requiring heavy-duty dependable prime movers whether used with excavators, bulldozers or other attachments.

Here are some of the reasons for contractors' preference of Eimco Tractors: (1) greater production, (2) lower maintenance, (3) easier operation.

Greater production is illustrated in the Glendo Tunnel Job and on every job where an Eimco 105 Tractor is working. In an open hearth slag pocket cleanout job, the Eimco worked daily week in and week out, whereas competitive machines failed after only a few days operation. In hard clay, Eimcos with excavators out-performed all conventional loaders two to one. Against rubber tired loading equipment of the same bucket capacity, the score was nine trucks for the Eimco to two trucks for the conventional.

Maintenance on the Eimco Tractor is low in cost and easy to perform because of unit assembly. Each assembly can be removed or serviced without completely dismantling the tractor. Low cost is assured because Eimcos are built strong to give three to five times the service life of conventional tractors.

The Eimco Tractor is easy to operate, only two small handles control all movements of the tractor. It's made so that you can shift from forward to reverse or change speed in motion. Independent track control provides, for the first time, a tractor that can drive one track reverse and the other forward at the same time. Every operator is sold on the extra maneuverability of the Eimco Tractor.

Eimco Tractors with bulldozers or excavator attachments will move more dirt in any given period of time than any other equipment, per dollar invested.

Users of Eimco Tractors are enthusiastic! Why not investigate the finest in heavy-duty tractor equipment before you buy. Complete information on the Eimco 105 Tractor will be sent to you. Write today.

ALL OVER THE WORLD, wherever the work is tough and the going rough . . . Eimcos are doing a job that turns in a profit. The sturdy, dependable Eimco Tractor is built for hard work, heavy loads, and long life.

THE EIMCO CORPORATION

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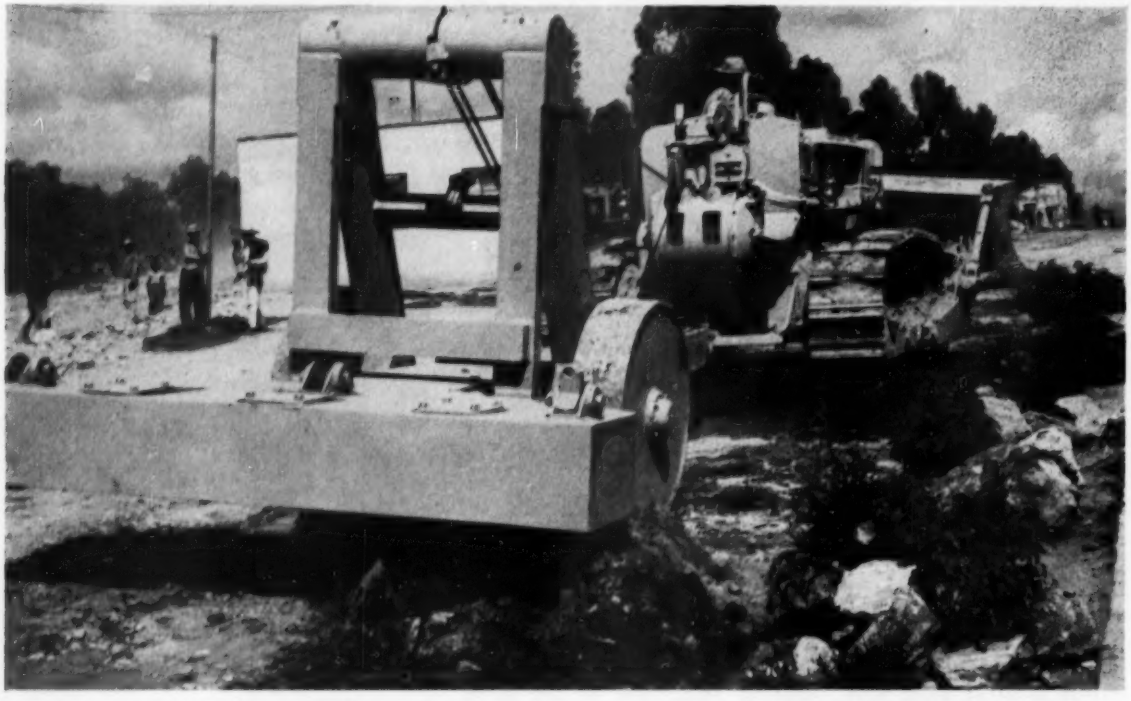
B-116

CONSTRUCTION 'ROUND THE WORLD



NEW ROADS IN MEXICO — Road construction is going on in Mexico, too. A Caterpillar D7 tractor equipped with 7A bulldozer is pulling a Cat No. 18 Ripper on a government road project between Santa Lucia and Olivar del Conde, Mexico. This model ripper using three teeth can penetrate down to a depth of 28 in. Equipment is owned by the Mexican government.

HEAVY HAUL — Twin-engine Euclid trucks, 34-ton size, on Capras Island, Guam, haul coral rock weighing as much as 60 tons. The rocks are being used to repair and cap a 3-mi breakwater for increased protection against storms and typhoons. The sea wall is 50-60 ft wide on top; rises 25 ft above water and reaches a depth of 130 ft. (Official U. S. Navy Photograph)

SUPPLIES ON WAY UP — The shortest distance between two points is a straight line but sometimes it is straight up. This Bell helicopter hauls supplies to repair an electric transformer located at 7,000 ft in the St. Gotthard Pass in the Swiss Alps. At the time, ground transportation was buried under mountains of snow. The helicopter carries an average load of 900 lb.

Why Did Contractors use Armco Structures

FOR THESE EXPRESS HIGHWAYS?

Of course, the Armco Corrugated Metal Drainage Structures met specifications. But the main reason was that the contractor found Armco Structures more advantageous to install.

These advantages are usually expressed in terms of lower cost. And there are many ways in which a contractor can save money, cut labor costs, and speed work. Below are typical reasons why Armco Structures permit contractors to bid low and retain ample profit. It will pay you to investigate Armco Structures for your next job.

- ☐ **MATERIAL COSTS ARE LOW**
- ☐ **SMALL CREW HANDLES EVERYTHING**
- ☐ **BOLTED ASSEMBLY SPEEDS WORK**
- ☐ **BAD WEATHER WON'T STOP JOB**
- ☐ **NO HEAVY EQUIPMENT NEEDED**
- ☐ **49 ARMCO PLANTS SIMPLIFY DELIVERY**

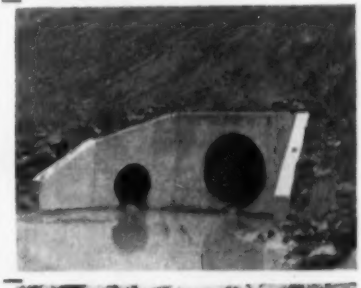
Armco Drainage Structures, supplied in a wide range of sizes, are available as: Standard Corrugated Metal Pipe and Pipe-Arch (also supplied as ASBESTOS-BONDED and PAVED-INVERT); Armco MULTI-PLATE Pipe, Arch and Pipe-Arch. Write us now for more data. Armco Drainage & Metal Products, Inc. 4125 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO
DRAINAGE STRUCTURES

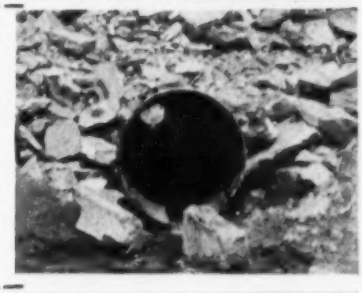
Other Armco Products include: Steel Buildings • FLEX-BEAM Guardrail • Retaining Walls • Sheeting • Liner Plate • Welded Steel Pipe • Bridge Plank • Pipe Piling and Pile Shells

NEW YORK THRUWAY 10′ diameter Armco MULTI-PLATE Pipe

GARDEN STATE PARKWAY 10′ diameter Armco MULTI-PLATE Pipe



OHIO TURNPIKE 5′ and 9′ diameter Standard Armco Pipe



WEST VIRGINIA TURNPIKE 42″ diameter Armco ASBESTOS-BONDED Pipe

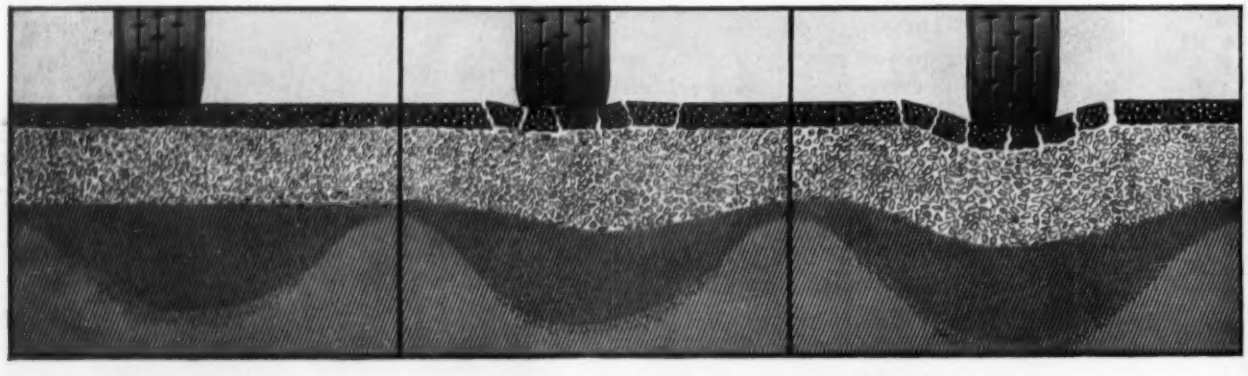
TURNER TURNPIKE Quadruple 14′ diameter Armco MULTI-PLATE Pipe

PENNSYLVANIA TURNPIKE 6′ diameter Armco PAVED-INVERT Pipe

Build YOUR Roads with a FOUNDATION . . . at low cost with a SEAMAN

Sub-grade soil stabilization with the SEAMAN MIXER is economical, quick and easy to do — and adds years and years of life to the base course. It cuts maintenance so sharply that the dollars budgeted for road repairs will pay for many miles of new and better highways.

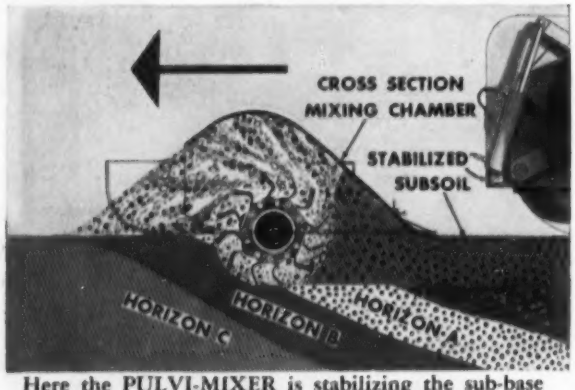
And, of course, if you up-grade the quality of your sub-base soil by mixing it with gravel or gravel and binder, your maintenance savings are proportionately larger and extend over an even greater number of years.



Sub-base failure is caused by soils of different natures reacting unevenly to moisture. Here a weak spot is developing in an *unstabilized* base. SEAMAN stabilization prevents this.

The breakdown of the soil in the sub-base through the disintegrating effect of moisture causes a localized movement and weakening in the base above.

As traffic pounds the base, cracks appear and the sub-base is weakened further by traffic loads and by permeation of additional moisture. The bridging effect of the base can no longer carry the load.



Here the PULVI-MIXER is stabilizing the sub-base by blending the different soils (soil horizons A,B,C) to attain a course which is uniform in moisture, density and thickness. Weak spots will not develop and the base above will withstand years of traffic punishment.

BLEND AND ASSEMBLE SUB-GRADE SOILS FOR MAXIMUM STRENGTH WITH THE SEAMAN

Sub-grade soils vary in physical characteristics and consequently in their reactions to moisture. It is their unequal movement and the presence of undesirable voids that cause heaving, pot-holing and breakup of the pavement. But one low cost pass with the SEAMAN blends and assembles those soils to uniformity in character and strength. This well-processed soil will reduce frost-boils, spring break-up and pavement failure.

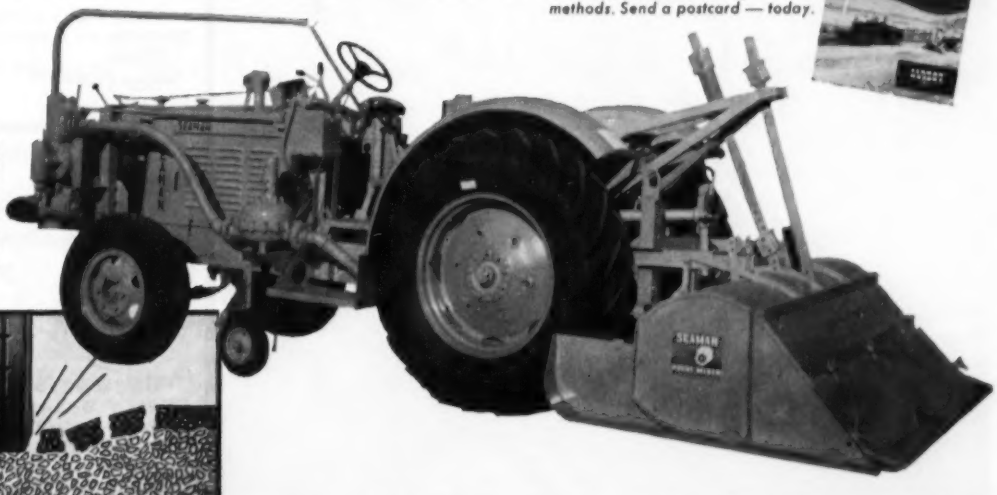
that will support a wearing surface!

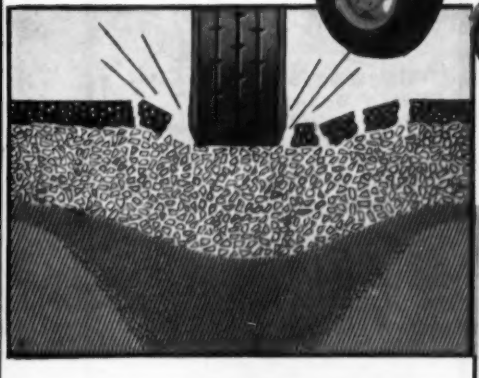
PULVI-MIXER

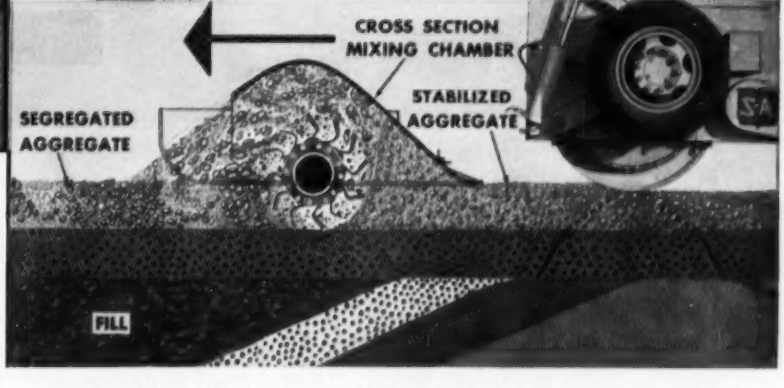
For a complete description of the SEAMAN TRAV-L-PLANT and the SEAMAN Self-Propelled PULVI-MIXER write for Bulletin TPS. It shows many field scenes and describes SEAMAN mixing methods. Send a postcard — today.

The Seaman TRAV-L-PLANT.

7 ft. mixing width; gasoline or diesel powered. Equipped with pump, tachometer assemblies, volumetric meter and spray bar for precision application of bitumen or water.







Complete breakdown of the base has started a chain reaction as more and more moisture permeates the fault and establishes repeated breakdown cycles along the width and length of the pavement.

. . . AND MIX THE BASE ITSELF WITH THE SEAMAN

No matter what materials — gravel, crushed stone, sand-clay, or native aggregates of any type; *no matter* what binders — bituminous, cement or chemical additives, — there is no equipment other than the SEAMAN that will blend, mix and assemble the materials so that the unstable segregation of coarse and fines is corrected. There is no other equipment that will so uniformly, quickly and completely distribute the binder throughout the mix. And SEAMAN-mixing costs are so low that only actual experience makes them entirely believable.

The SEAMAN PULVI-MIXER is processing the aggregates for the base course, correcting an always-present segregated condition — (the separation of coarse and fines). When the PULVI-MIXER has finished the work of blending and mixing the materials into a correct assembly, partially pre-compacted, the mix is ready for final rolling.

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During each shift, an Athey PR21 Rear Dump Trailer can make more load-haul-dump-return cycles than ordinary rear dump haulers. The reasons: The PR21 makes 90° turns, gets spotted faster. Its wide, open-mouthed body is easier to load. Top tractor gears are utilized with complete safety. *All* the load is dumped out in a few seconds. And the PR21 Rear Dump Trailer gets back to the loading area quicker.

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"IV'E WORKED PR21'S IN ROCK FOR MONTHS AND- COSTS ARE SUPRISINGLY LOW!-

MAY, 1955 • VOLUME 37 • NUMBER 5

HENRY T. PEREZ, Editor

CONSTRUCTION METHODS AND EQUIPMENT

Low Bidders Are Not Always Losers

A BITTER CONTRACTOR came to us recently with an intriguing idea. Tired of bidding unsuccessfully on job after job—and worried about the amount of money and effort it was costing him to make up his not-low-enough estimates—he wanted to start a campaign to have unsuccessful bidders repaid for costs of preparing their bids.

The contractor's thought was that all the bidders were performing a service in competing for the job. The owner or awarding body, therefore, should be obliged to pay for this service. A novel idea indeed!

Well, the rebuttal is obvious, of course. Even if the basic premise is correct—that the mere act of tendering a bid is a service to the owner—there would be nothing to prevent the unscrupulous from taking out a set of plans, making an absurdly high bid, and collecting a fee for doing so. Prequalification of bidders would not solve the problem.

Admittedly, bid preparation can be an expensive procedure. Such things as quantity takeoffs, site inspections and detailed estimates do cost a lot in time and money if they are done conscientiously. And the higher bidder has to be repaid for them by someone, at some time or another.

As things stand nowadays, unsuccessful bid preparation costs are paid for out of past profits or will be repaid from those of future jobs. In effect, some owner for whom the construction firm has done or will do work shoulders the cost indirectly.

That, our contractor friend believes, is not fair: Repayment comes from the wrong owner, and often comes too late. Furthermore, he contends that this starts a vicious cycle in that the costs of preparing an unsuccessful bid induce a contractor to increase his profit-margin figure in his next bid to offset them. This results in another high bid, and so on, until he either luckily hits a "sleeper" or loses his shirt. The alternative, our friend concludes, is to make sure you are low bidder, at any cost—and lose your shirt that way. A bitter chap, he.

All this is phony reasoning, obviously. The way to recoup out-of-pocket bidding expenses, the way to make up for money-losing jobs is to *be* low bidder at future lettings—but low bidder at a profit.

After figuring how to trim your costs to a minimum and after making carefully detailed estimates, it is reasonable to hope and expect that your bid will be low and that you will get the contract—assuming, of course, that you really wanted it in the first place. "After all, we're as good an outfit as the next." Then, when you're underbid, it is only natural to think, "Why that so-and-so. He can't possibly do the job for that kind of money!"

Can't he though? Perhaps he gets more production from his equipment because he has laid out the job to take advantage of all that has been built into his machines. Perhaps he gives them better maintenance to increase their working time.

Maybe he has figured a new method to attack the job, as did the contractor who bid 40% low on some difficult work at Niagara Falls, then completed it successfully with the help of a daring cofferdam scheme (see next page). Maybe he has worked out new concrete forming methods or devised new combinations of equipment, as described elsewhere in this issue.

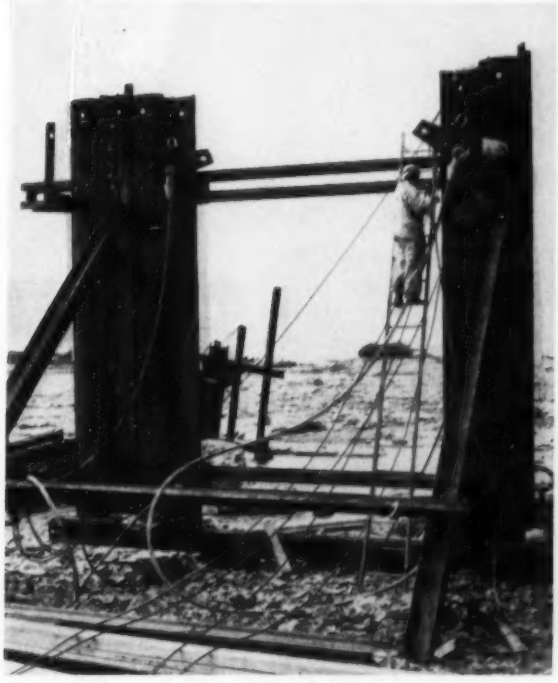
Perhaps by up-to-date record keeping and cost accounting procedures he knows what his costs actually are—can spot the financial leaks early enough so he can plug them before it is too late. Maybe he gets more cooperation from his man because he treats them fairly, increases their morale with a sound safety program. Maybe his insurance costs are lower than yours because he is safety conscious. And so it goes.

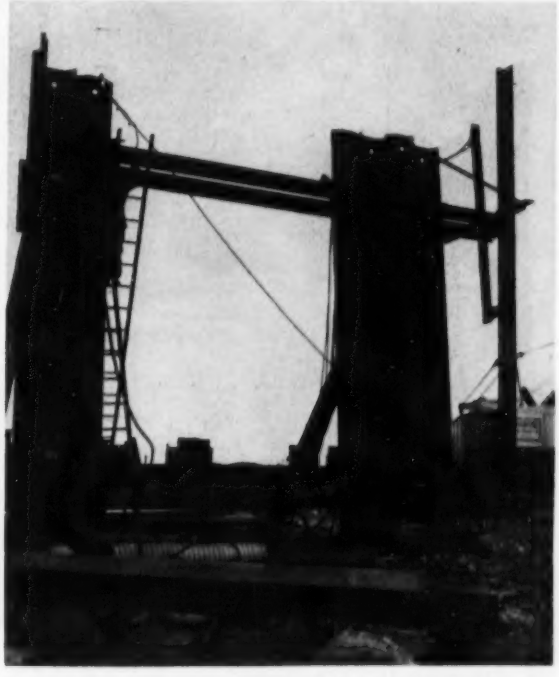
Sure, competition is rough. But no one really believes that all low bidders "can't possibly do the job for that kind of money." The outfit that keeps its construction plant up to date and operating efficiently, that has its staff and men whole-heartedly behind it, that keeps its field and office procedures modern, and that has the initiative and drive to devise new and better methods—that outfit will prosper despite competition. Try it and see.

FACELIFTING JOB, to improve appearance and flow of water over United States flank of Horseshoe Falls, takes place within cofferdam (upper left). Now only 200 ft out from shore, upstream dike will be extended another 150 ft in water as deep as 18 ft and in current up to 25 mph. Contractor for difficult and spectacular project is McLain Construction Corp., Kenmore, N. Y.

Guyed Shield Deflects Niagara For Daring Cofferdam Construction

SMALL PROTECTIVE SHIELD IS GUYED to an island upstream (far right in right photo). Here it is idle while a wing dam is being built downstream. But behind its protection a stone and sheetpile dike has been built 200 ft out into the raging Niagara River, whose tremendous force and steep gradient are clearly visible (above) as it sweeps around shield at the outer corner of the dike.





LARGE PROTECTIVE SHIELD IS BUILT to extend dike 150 ft farther into river. This shield will be 26 ft long (twice as long as small one), and dike will be extended in 20-ft increments while shield deflects river's swift current. When completed, of course, shield will be fully faced with sheetpiling. Post at right (above) is to hold wales that brace dike's driven sheets.

THE HONEYMOON SEEMED OVER for McLain Construction Corp. even though it had just won a $596,000 contract: Its bid to excavate some 24,000 yd of rock from a 6-acre site on the lip and flank of Niagara Falls was 40% below both the next lowest bidder and the U. S. Corps of Engineers' without-profit estimate. In addition, the Niagara River had to be diverted so the work could be done in the dry. This called for a cofferdam extending 350 ft from shore, in water up to 18 ft deep and flowing 25 mph.

Secret of the Kenmore, N. Y. outfit's low bid was President Norman H. McLain's daring scheme for building the diversionary cofferdam behind the protection of a steel-sheeted movable shield. Held by cables to an island 1,300 ft upstream, the shield deflected the

UPSTREAM DIKE AND WING DAM have dried 90% of excavation site, where rock removal is in progress. Large shield is in place to start 150-ft dike extension so rest can be uncovered. Note how shield has deflected current, and safety "man trap" behind it.

swift current so that a sheetpile-and-stone dike could be built out into the raging river to unwater the excavation site.

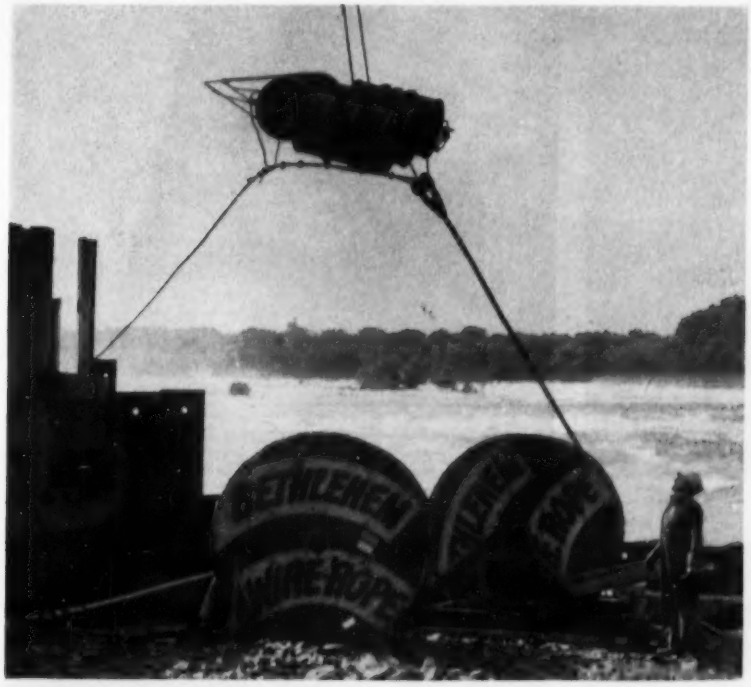
Before the shield was placed in operation, however, the dike was started and built out a short way from the shore. For this, quarry-run stone was end-dumped into the river, and Bethlehem AP-3 sheetpiling was driven across the upstream face as protection against erosion. The sheeting was driven by a McKiernan-Terry No. 7 hammer operated by air from a Jaeger 600 - ft compressor. Surprisingly, air was delivered through an 8-in. Pumpcrete pipe that helped act as a receiver.

When dike continuation became too difficult because of current, McLain brought his shield into play. Here's the way it worked:

The shields (two were used during the course of the job) consisted of a crib-like frame of steel beams and angles whose downstream side was faced with vertical sheetpiling. Some 20 ft wide and high, the frames were about 13 and 26 ft long.

Cables to an island 1,300 ft upstream anchored the shields. The 13-ft unit, which was used while extending the dike the first 200 ft out from shore, was bridled from

STONE FILL FOR WING DAM is pushed into place behind sheeting by Cat D7 dozer. Note, at left, Richmond Tyscrus that are used as tie rods to hold back the top of the piling.



GUY CABLE FOR LARGE SHIELD is hooked to barrel float that will be pulled upstream to island anchorage. Two of these 1⅞-in. pre-stressed bridge-suspender ropes hold shield.

its upstream corners to two 1¼-in. Bethlehem wire-rope guys. On the island, these were dead-ended in a 300-ton concrete and steel anchorage pinned to rock by Bethlehem wedge-anchor bolts. Thus the shield would not be swept away should its operating cable break. The operating cable itself, a five-part line of ¾-in. wire rope, was clipped to both of the guy cables ahead of the anchorage. Its live end ran back down to the dike, where it was controlled by a drum.

Lateral movement of the shield was regulated by another cable running from it to the river bank. The shield itself was lifted and positioned by a 50-ton Lima 802 crane on the dike.

The shield was placed on the river bottom upstream from the dike, and slightly overlapping the end of the line of previously driven sheetpiling. A series of sheetpiles on the shore end of the shield's sheeted face acted as a flap gate to close off the gap between shield and dike. Thus the shield sheeting was really an offset temporary continuation of the dike face. It deflected the current so the dike could be built out, in comparatively still water, about 10 ft farther at a time.

To build the dike behind the shield, sheetpiling was first placed and driven. Sheets were kept plumb by two downstream horizontal 10-in. 42-lb H-beam wales. One wale was placed 3 ft off river bottom and the other a few feet above water level, with their riverward ends held by a vertical steel post on the outboard corner of the shield. The post itself was adjustable, top and bottom, for alignment and plumbing.

Quarry-run stone fill was dumped behind the sheeting. To resist its outward pressure, the line of sheetpiling was held by long Richmond Tyscrus as tie rods. These were fastened to every fourth sheet, just above lower wale level, and ran in pairs to 6- to 8-ft steel-beam deadmen which the dike stone buried as it built up. Similar tie rods on 12-ft centers were anchored individually to 4-ft deadman beams to hold the upper part of the sheeting.

When the 10-ft length of sheetpile-and-stone dike had been built up above water level behind the shield, the latter was repositioned for another 10-ft advance.

Wing-Dam Closure

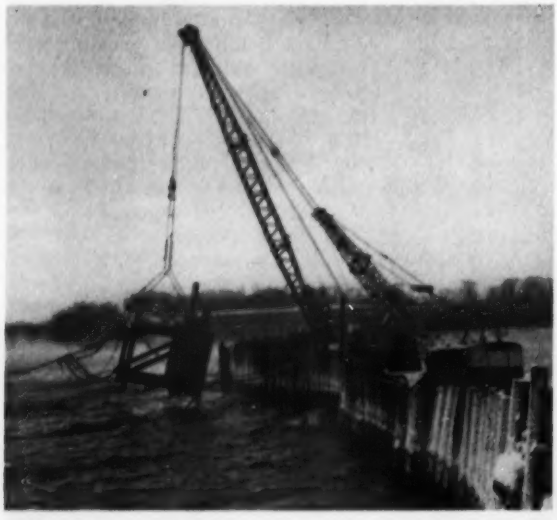
By these means the cofferdam dike was carried 200 ft out into the Niagara River. From this point a similar dike, or wing dam, was built in a downstream direction. This closed off 90% of the work area so an early start could be made on the excavation. The wing dam could be built without shield protection because it was parallel to the current and somewhat in the backwater of the main dike.

But McLain still had 150 ft to go, out toward the center of the river, with his main dike. This was advanced in 20-ft increments behind the protection of the 26-ft shield.

Like the small shield, the large one was guyed to the island 1,300 ft upstream. However, two 1⅞-in. Bethlehem prestressed bridge-suspender cables were required to hold this one against the estimated 100-ton pressure of the current on

SHEETING IS WELDED to H-beam wale by men wearing safety lines. This is on wing dam, and wale is temporarily supported on cage that catches men if they fall in water. Other beam holds cage.

BLAST HOLES ARE STARTED within cofferdammed area, even before it has drained completely, by these Ingersoll-Rand Jackhammers and by wagon drills. Lima shovels will load out the blasted rock.



SMALL SHIELD IS PLACED by Lima crane, upon completion of 24,000-yd excavation job, so the dike can be removed behind its protection. Dike removal is the reverse of construction operations.

STONE DIKE IS REMOVED by Lima dragline, and sheetpiling will be pulled. Winter-time work on the fast-flowing Niagara River was no picnic, but neither was cofferdam construction in the fall.

it. These cables were anchored and were non-operable: The big shield was just swung on an arc as the dike was built out. It was, nevertheless, guided by a side cable back to shore, and was placed by crane.

Moving the shield and placing of wales, sheetpiles, tie rods, and stone fill was handled in a manner similar to that used behind the small shield. In the maximum 18-ft depth of water, stone dike thickness varied from 36 ft at the bottom to 22 ft at the top. The sheetpiling cantilevered some 4 ft above the stone fill.

When the dike had been built full distance out in the river, a second wing dam was turned downstream from the end to divert water from the rest of the excavation site.

Inside the areas cofferdammed by upstream dike and wings, 24,000 yd of rock was blasted and removed. Then began the job of removing the cofferdam. This was simply a matter (but not necessarily a simple one) of reversing the construction procedure. Behind the protection of the small shield, the stone fill was recovered by dragline and the sheetpiling was pulled.

McLain didn't want his men, in case of a mishap, to go over the Falls—they had no barrels. So, to keep them safe during the hazardous phases of cofferdamming, the men wore safety belts and lines. As an extra precaution, two steel "man traps" were built and kept positioned just downstream from the spot where work was in progress. These cage-like units, 20x20x20 and 20x20x40, were to catch any men who might accidentally fall into the water.

Superintendent for McLain Contracting Corp. was Clifford Stumm. Edward M. Robbins was resident for the Corps of Engineers, Buffalo District, which had cognizance over the job.

Thin-Wall Pipe Makes Foundation Pile

2 YD P&H CRANE teamed with a Vulcan 50-C differential acting pile hammer was able to drive 32 piles to a depth of 35 ft in one 8-hr. shift on this Florida project.

LONG-LENGTH SPIRAL WELD foundation pipe of 12-in. dia and 7-gage thickness, filled with reinforced concrete, will support the 100x200-ft power house being constructed for Florida Light & Power Co., East Palatka, Fla.

The 365 cast-in-place piles are being driven into sand and clay soil to depths of 35 ft. Each pile is based on a 56-ton bearing capacity.

Murphy Construction Co., West Palm Beach, who has the contract, has driven as many as 32 piles in one 8-hr shift—15 min to a pile. The pipe, supplied by L. B. Foster Co. is easy to handle because of its light weight.

A flat plate is welded on to the pipe to serve as a driving point. To drive the pile, a 2-yd P&H 855 crane spots the pipe over the guide stake. A Vulcan 50-C differential acting pile-hammer striking 120 blows per min, drives the piling. The blow generated by the hammer is 15,000 lb. Power is furnished from a 65-hp vertical steam boiler.

When piles need to be extended for greater penetration, a welder inserts a sleeve and then tacks on extra lengths of pipe atop previously driven section.

WHEN PILES NEED to be extended beyond 35 ft., welder inserts sleeve and tacks on required extra length of pipe.

COMPLETED PILE of 7-gage, 12-in. dia pipe was driven into sand and clay soil. Each pile has 56-ton bearing capacity.

Thruway Carves Path Across Busy Suburb

"IT'S MORE LIKE a subway job than a highway," says Jim Lyttle, project manager on a tough section of the New York Thruway. Lyttle is building a tangled stretch of superhighway just above the New York City line. The 10 lanes of concrete not only cut through the busy city of Yonkers, but also follow heavily traveled Central Ave along most of the route.

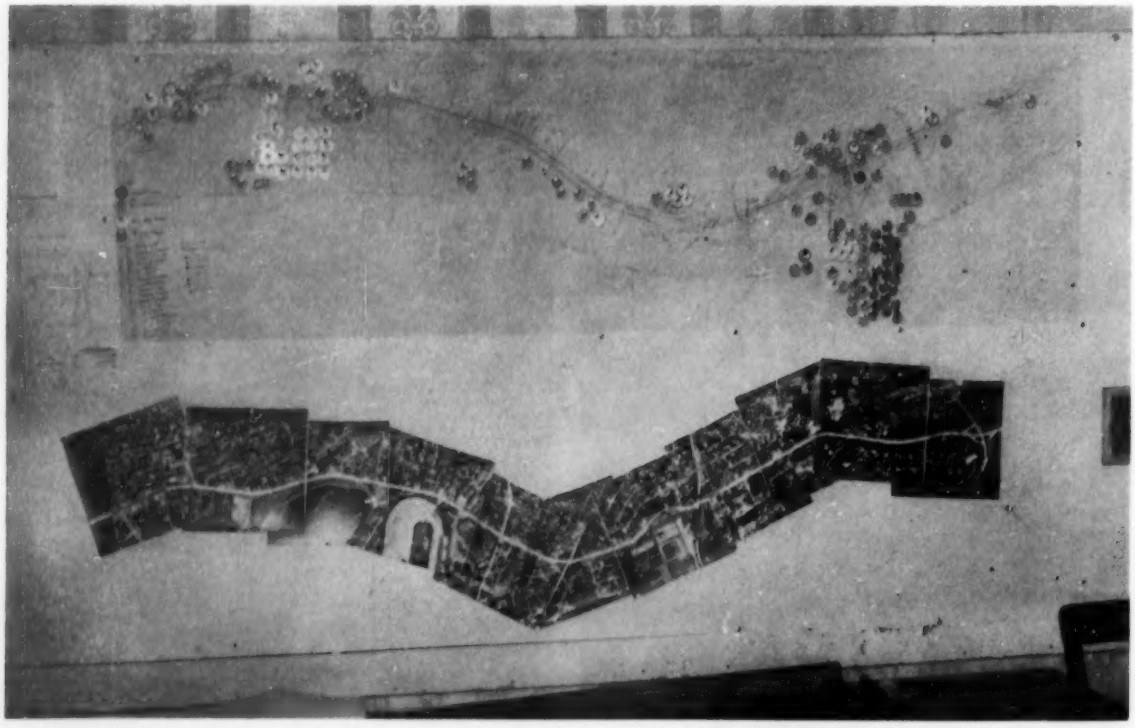
Only 3 mi long, the job has a contract price of $15,400,000, and includes eight major structures and miles of retaining walls. Joint-venture contractors Corbetta Construction Co. and Yonkers Contracting Co. have more than 500 men on the job, a big fleet of excavating equipment, and a unique form-fabricating yard.

It's a lot different from the section of Thruway that Corbetta completed last year near Kingston. "We can't go in here and take off like we did in the country," says Lyttle. Mass production just isn't possible. In the first stages of the job, the big problem is to complete a maze of service roads so that traffic can be shifted off Central Ave. In most areas, the Avenue has to be reconstructed completely.

PROJECT MANAGER Jim Lyttle keeps in close touch with all parts of job with two-way radio. Besides 60-watt set in office, there are 20 Motorola 30-watt sets in cars and pickup trucks.

Besides traffic, there are other problems that make it tough to maintain the tight schedule. Many high-capacity utilities, for instance, run across or along the job at several points. On the heavy excavations, blasting has to be done with extreme caution to prevent damage to near-by dwellings, and sometimes there is no place to dump the rock.

But the job is moving along as fast as possible, and the team of Corbetta-Petrillo turns in new tricks every day. Some of their time-saving methods are illustrated on the following pages.



OPERATIONS CHART above strip map of air photos shows location of all major pieces of equipment. Contractor can quickly see best ways of shifting or distributing his equipment fleets. Color of pins indicates whether machine is owned or rented.

HEAVY EXCAVATION under way in midst of residential area. Big Northwest 80D shovel with 2-yd bucket loads rock into Euclid as wagon drills prepare to blast next lift. Working in built-up areas requires contractor to maintain good public relations.

DEPRESSED SECTION of Thruway requires high retaining walls to support parking area for race track. P&H truck crane places ready-mix concrete in footing forms with Insley lay-down bucket.

TRENCH EXCAVATION proceeds slowly near high-capacity underground electric line. Blasting is done with extreme caution. Job calls for hundreds of new utilities and many relocations.

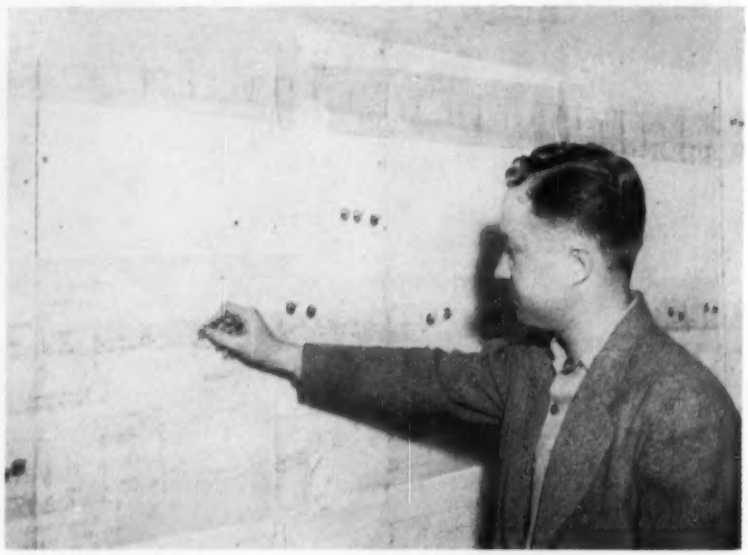
Telescopic Panels Speed Form Erection

TELESCOPIC PANELS are solving a tough forming problem on the Yonkers section of the Thruway. The job requires about 3 mi of walls, and no two walls are alike. They vary not only in height, but also in the slope of the coping.

Conventional prefabricated panels could not do the job because they would require too much modifying for each reuse. So, Corbetta has developed a new trick—telescopic panels. They move up or down over a base panel to adjust for wall height, and also rotate to conform to coping slope. (Small quadrilateral or triangular plywood sheets close the gap between top and bottom panels.) The system speeds form erection, cuts rehandling, and increases reuse.

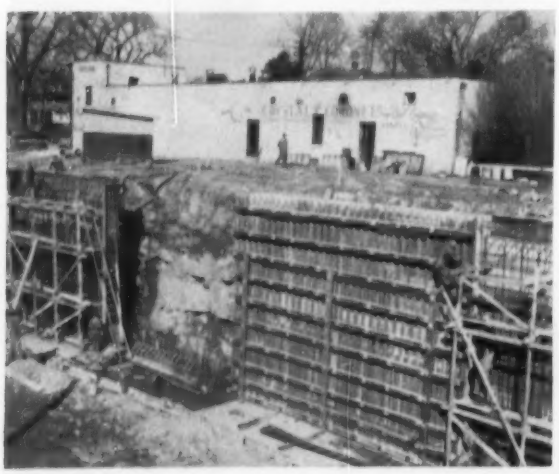
Both base and telescopic panels are constructed of ¾-in. plywood backed by 2x6 studs 12 in. on center. On very high forms, studs are spaced only 6 in. apart. Horizontal walers are double 3x6's held permanently against the studs with 10-in. bolts. On large form panels, three vertical strongbacks are added.

Telescopic panels differ from base panels only at the quarter points; the stud is increased to a 3x6, and its length is extended about 3 ft beyond the smaller studs. This is done to increase the rigidity of the panel and to provide a strong prop when the panel is jacked in place with come-a-longs. All studs in the telescoping panel project below the plywood facing to mesh into the base panel. Most telescopic panels are 9 ft high, including the projecting studs. Base panels are made in five sizes, 5, 9, 13, 17, and 21 ft high. Combined with telescopic panels, they can form any wall up to 30 ft high, and also take care of the slope of the coping.

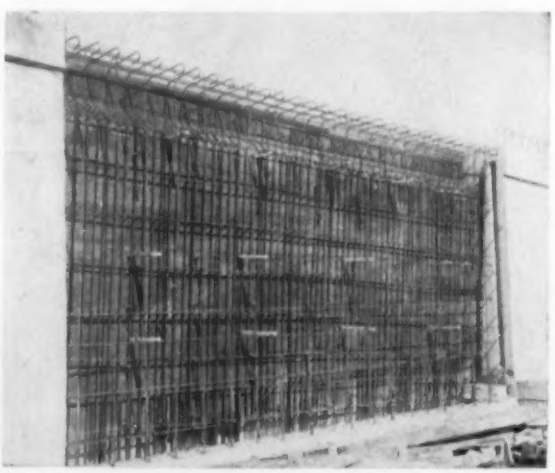


FORM SUPERINTENDENT Joe Gardeski places pin representing form panel into retaining-wall chart. Clever system records panel locations, reuses, and pouring progress.

To telescope a panel, the bolts in the base panel that hold the top walers to the studs are loosened. This frees the projecting studs of the telescopic panel just enough to allow them to be pulled up or pushed down, whichever is required. If the panel has to be moved up, a crane usually pulls it into approximate position and then come-a-longs do the rest. If the panel has to be lowered, the job is done with come-a-longs as soon as the plywood filler sheet between the base and telescopic panels is removed. When the top panel has been moved up, the plywood filler sheets between the top and base panels are removed, and replaced



HUGE PREFABRICATED FORMS for retaining wall are erected in depressed section. Panels are prefabricated in yard and hauled to site on trailers. Average is 30 ft wide.



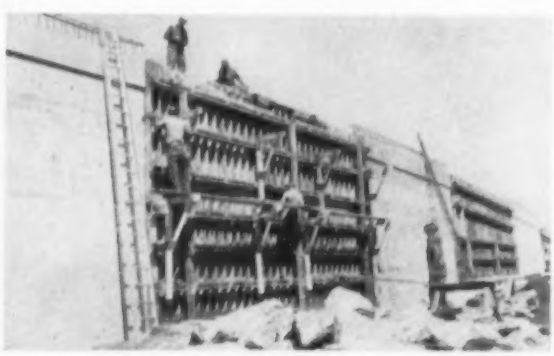
REINFORCING STEEL, wood spreaders, and tie rods are set in place after back form is erected. Job has more than 3 mi of walls, and most of them have copings with varying slopes.

PANEL FOR FRONT FACE of wall is set in place with P&H 35-ton truck crane. Top panel will have to be pulled up to meet sloped coping on previously poured sections of wall.

BOLTS HOLDING TELESCOPIC PANEL to base panel are loosened. When projecting studs of telescopic panel are free, workmen hook cable sling around panel and crane pulls it up.

TELESCOPIC PANEL is lifted up from base panel until slope and grade are correct. (Men were not on panel during lifting) Note gap between plywood of top and base panels.

PLYWOOD SHEET that filled the gap between top and base panels on previous pour is pulled out and replaced with larger, precut piece. Come-a-long at bottom does final positioning.



FORM IS COMPLETED less than an hour after it was stripped from its previous position. Workmen tighten bolts from scaffold made by hooking prefabricated brackets over walers.

with new precut sheets. When the telescoping panel is jockeyed into position, the bolts on the walers of the base panel are tightened, making the wall panel act again as a single unit.

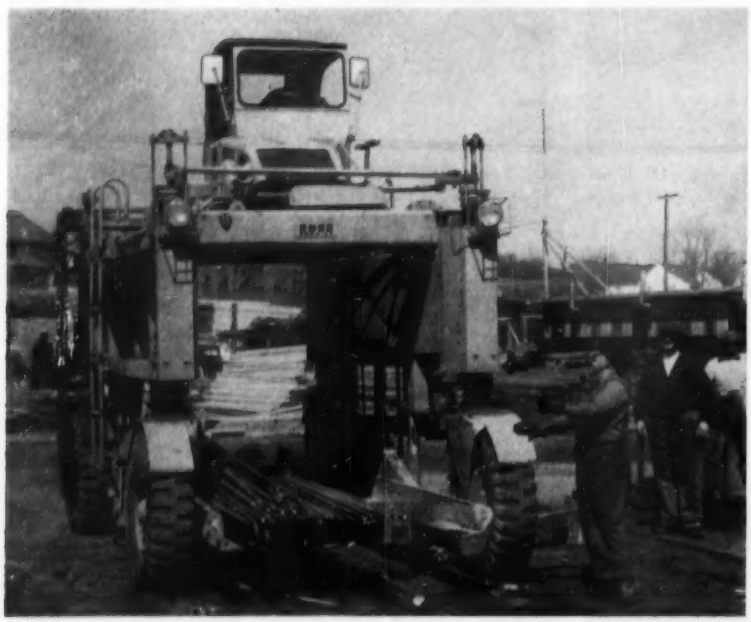
The complete operation of stripping a panel, moving to a new section of wall, telescoping the top panel, and securing in place takes less than an hour. Complete panels average 30 ft in length, but a few are made as large as 40 ft. They are heavy, but P&H 35-ton truck cranes easily move them along the wall, and sometimes even over it. After each panel is reused about 6 times on the front of a wall, it is transferred to the back where smooth surfaces are not as important.

When both front and back panels are in place, workmen quickly erect scaffolds simply by hooking prefabricated brackets over the walers and connecting with planks. With a safe place to work on, men easily bolt the two panels together with Richmond ¾-in. Tyscrus.

Ready-mix concrete is placed in the forms by crane and bucket and vibrated. The following day bolts are loosened slightly to free the bond. After three days the form is stripped, moved to a predetermined section, and reused.

THRUWAY CUTS ACROSS SUBURB . . . Continued

Versatile Straddle Trucks Cut Material-Handling Time



STRADDLE TRUCK lifts pallet of reinforcing bars in contractor's yard. Two Ross Carriers keep busy handling lumber, tool boxes, form accessories, and supplies.

"WE DON'T PLACE anything on the ground unless there's a pallet under it," says Gerry Corbetta, one of the top managers on the Corbetta-Yonkers Contracting venture. And that's why two straddle trucks are probably the busiest machines on the job.

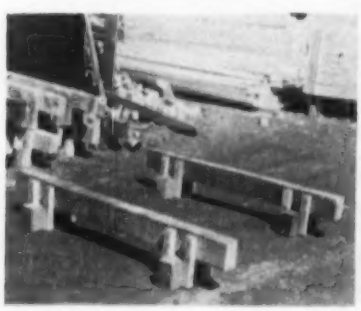
They handle reinforcing bars, lumber, tool boxes, curbs, form bulkheads, and all kinds of supplies. Traveling mostly on the main road that parallels the job, the two trucks carry a load anywhere in a matter of minutes. And they don't have to wait during unloading. The truck simply lowers the pallet of material on the ground, backs off, and moves to the next job.

Loading

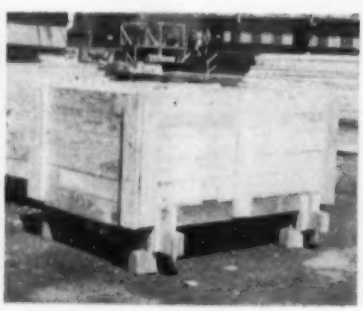
Loading, of course, is just as easy. At the reinforcing yard, for instance, workmen take bars right from the bending machines and pile them on pallets. When the straddle truck arrives there is no waiting. It moves over the pallet, lifts it up, and takes off.

Conventional trucks carry a bigger load, but they don't make nearly as many trips as straddle trucks. Besides, they are out of action during loading and unloading. And on heavier loads, they have to be both loaded and unloaded by crane. Corbetta-Yonkers' two Ross Carriers handle a 5-ton load without difficulty.

Rods, lumber and similar material are carried on pallets consisting of two 4x6's, each supported on 4x6 blocks. Tools and supplies are hauled in several types and sizes of boxes with built-in 4x6 pallets.



WOOD PALLET consists of two 4x6's, each supported on 4x6 blocks. Lifting arms on straddle truck easily fit over projections.



SUPPLY BOX with built-in pallet of 4x6's carries tools, accessories, small equipment, fuel cans, and similar items.

REINFORCING RODS are taken right off Peddinghaus bender and piled on pallets. When Ross Carrier arrives it moves over pallet, picks it up, and takes off. A conventional truck would have to wait while the material is loaded and then wait again while it is unloaded. Besides, for the heavier loads, a crane would be needed to do the lifting. Ross Carriers handle a 5-ton load without difficulty.

PAVED STREET paralleling job provides smooth haul road for straddle truck. Rig can reach any part of job in matter of minutes. Driver of truck also operates lifting machinery.

BAR CUTTER snaps reinforcing bar in prefabrication yard. Long bar is moved along roller conveyor to cutting point, where workman shoves it under continuously moving scissor-type cutter.

RADIAL-ARM SAW speeds lumber cutting in form fabricating yard. Wall and column forms, bulkheads, deck forms, and telescopic panels for retaining walls are all prefabricated in yard.

LOOKING OVER JOB PROGRESS are Edward Petrillo, president of Yonkers Contracting Co.; James Lyttle, project manager, and Roger Corbetta, president of Corbetta Construction Co.

Front-end loader dumps into hopper and swings back to sand bank as ...

TRACTOR-MOUNTED CONVEYOR with adjustable spout loads sand into outside line of railroad cars as Allis-Chalmers HD-15 front-end loader empties 3½-yd bucket into hopper.

← ADJUSTABLE SPOUT pivots at end of conveyor to reach either line of railroad cars. Hydraulically operated piston with 4-ft stroke is fed by special pump powered off tractor's fan belt. Operator controls pivoting of spout from his seat.

Tractor-Mounted Conveyor Loads 60 Cars a Day

ALBERT C. SMITH
Associate Editor

BY MOUNTING A BELT CONVEYOR across a crawler tractor, an ingenious contractor has developed a rig that loads 3,600 cu yd of sandy fill every day into a double line of railroad cars.

The 35-ft conveyor has a hopper at the base and an adjustable spout at the top. The spout pivots to reach either line of cars. Two front-end loaders dig into a bank of sand running parallel to the cars, then swing over the hopper and dump. The material is carried up a 36-in. belt and chuted into the cars as the Caterpillar D8 tractor creeps the conveyor along the double line of 60 railroad cars.

Made and operated by Villa Contracting Co. of Westfield, N. J., the high capacity rig is the key to

POWER SHOVEL makes first passes at bank each time track is moved up. Bucyrus-Erie 1½-yd rig loads inside line of cars as tractor-mounted conveyor loads outside line. After bank recedes, conveyor loads all cars. Unique rig fills two lines of 30 cars each.

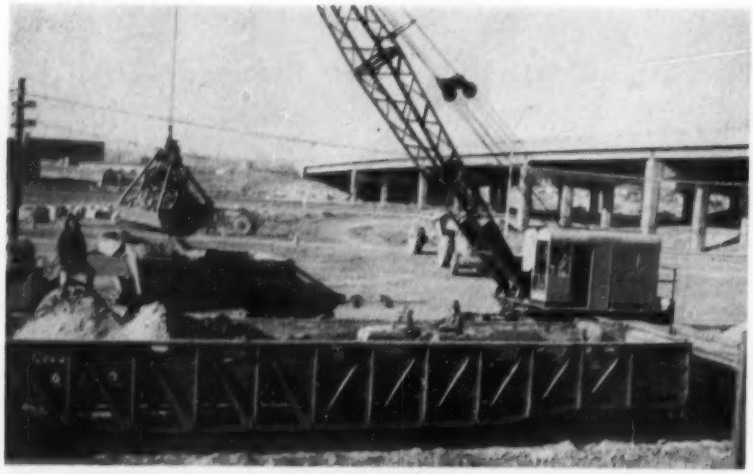
a big embankment job at the approaches to New Jersey Turnpike's Newark Bay Bridge. Villa is hauling 500,000 yd of sandy fill from Sayreville, N. J., about 30 mi away. Every day, 60 cars are loaded at the pit. They are brought up to the Newark job at night, and unloaded the next day by clamshells.

To make rail-hauling pay, Villa has to move 3,600 yd in a 9-hr day, and conventional equipment could not do it economically. In the first place, the bank is not long enough for a full 60-car train, so a double track is necessary. With this arrangement, only large power shovels could do the job. And they are much more costly than a tractor-conveyor. Besides, after the first few passes at the bank, the track would have to be moved up. The tractor-conveyor, however, works efficiently even when the bank is cut back 100 ft from the track.

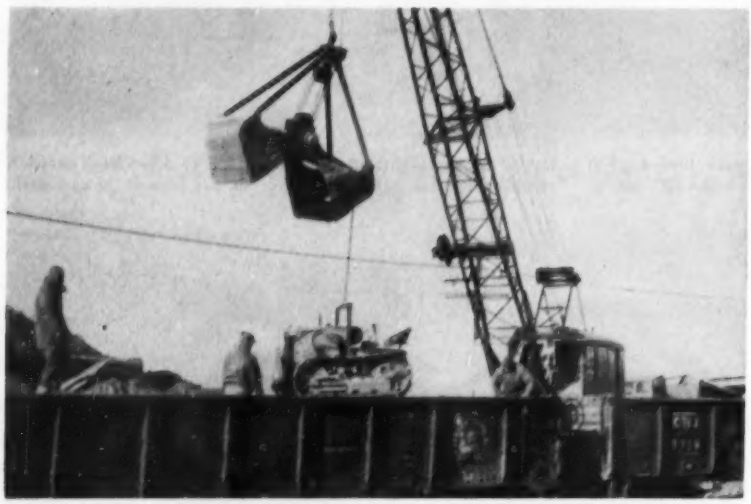
Another method, running single track spurs in at different levels, was not possible because the depth of suitable material in the bank is only about 25 ft.

Speed, economy, and simplicity make the tractor-conveyor the best rig for the job. Charged by two front-end loaders, it fills a 60-yd car in 8 min. and only two loaders are required to hit peak production, an Allis-Chalmers HD-15 and

BOLTED CONNECTIONS make it easy to assemble or remove conveyor. During loading, tractor springs are shimmed for better stability. Except for pump, conveyor works independently of tractor. Cleats on belt help move chunks of material.



CAR-UNLOADING at Newark is done by Lorain crane with 2½-yd clamshell bucket. Sand is dumped into fleet of Euclid bottom-dump wagons and hauled about 2,000 ft to fill.



CLAMSHELL BUCKET swung by Lima crane at unloading site transfers small Oliver OC-3 dozer from empty to full car. Bracket and chain device speeds dozer handling.

TWO CRANES unload 3,600 cu yd of sand a day into wagons as small dozers clean sides of railroad cars. After cranes unload six cars, locomotive moves six full cars into position.

a Caterpillar No. 6. Each time the track is moved up, however, a Bucyrus-Erie 38B shovel makes the first few passes, loading the inside line of cars. The outside line is always loaded by the conveyor.

To boost production as high as possible, Villa tries to keep the front-end loaders working in soft material. And he has developed an easy way to do it. As soon as the soft material is cleaned up, one dozer riding the top of the bank and another riding the bottom drag a heavy steel blade over the crest of the bank. This shaves the overhang and piles soft material.

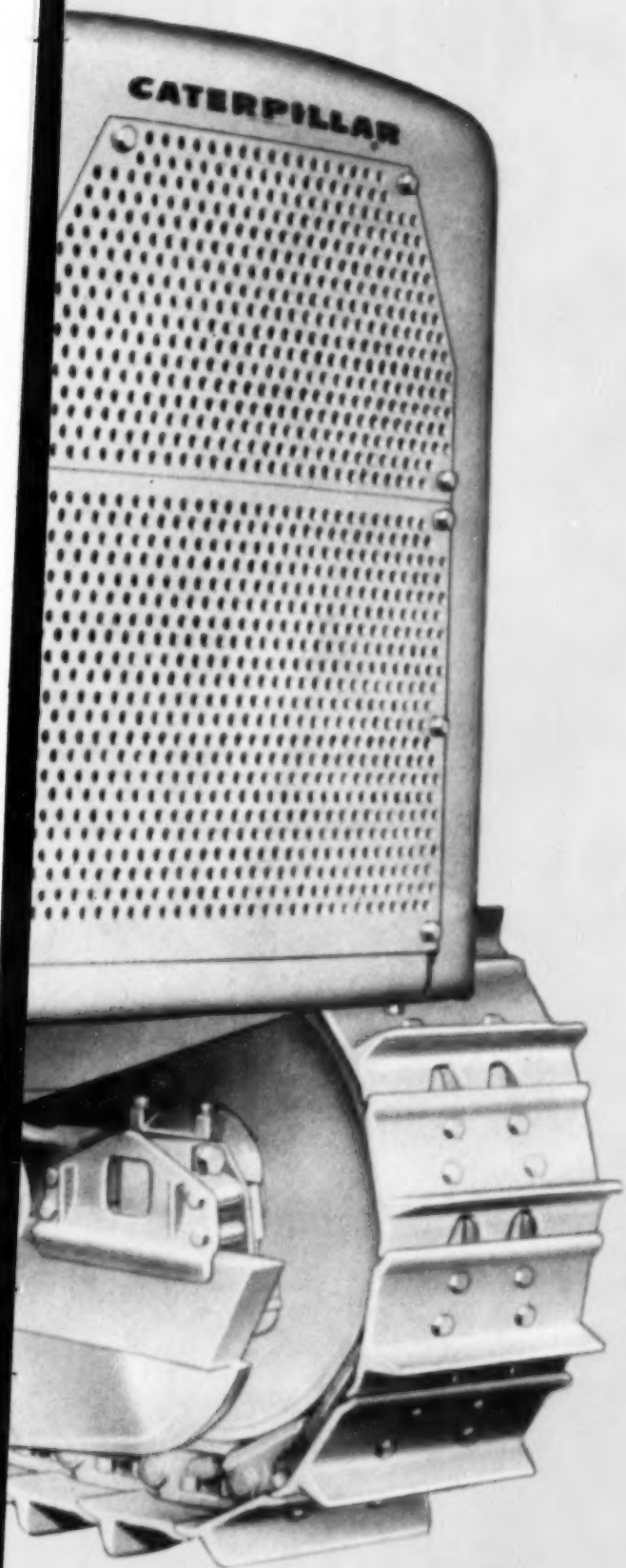
Conveyor operation is simple. As the loaders dump into the hopper, the material moves up the cleated belt and flows out of the spout. An hydraulically actuated piston with a 4-ft stroke pivots the spout to reach either line of cars. The piston is controlled from the tractor seat. A small hydraulic pump mounted on the front of the tractor is powered off the fan belt.

Except for this pump, the conveyor operates independently of the tractor. A Red Seal gasoline engine powers the belt through a chain drive. The conveyor is a conventional Trowbridge unit bolted to the tractor frame for easy assembling and dismantling. Tractor springs are shimmed for better stability.

Unloading

All railroad car handling is done at night. A train of 60 loaded cars is brought up to Newark as a similar group of empties is hauled down to the pit. The next day the cars are unloaded on a siding near the job by two 2½-yd clamshells, a Lima and a Lorain. They travel back and forth along a ramp built next to the siding. The train remains stationary as each clamshell moves along the ramp, loading the sand into a fleet of six Euclid bottom-dump wagons. When each clamshell unloads three cars, the locomotive moves the train ahead until six more loaded cars are in position. Clamshell buckets quickly load the Euclids as small Oliver OC-3 dozers heap the sand inside the cars. After a 2,000-ft haul to the fill, the wagons dump the sand and it is spread in 6-in. lifts with Tournadozers. Rubber-tired rollers achieve the required compaction.

G. Villa is project manager and R. Morra is chief engineer for Villa Contracting Co. L. Brown is project engineer, and L. Ripa is operations engineer for Howard, Needles, Tammen & Bergendoff, consultants.



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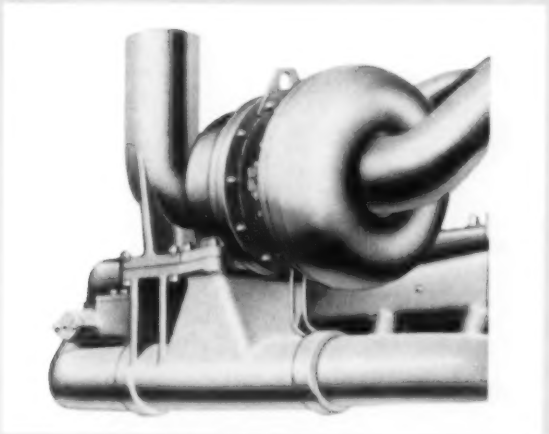

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The D9's new Turbocharger is driven by the engine exhaust, utilizing energy which would otherwise be lost. In addition, it packs air into the engine according to engine *load*, not speed. This means more working horsepower—greater performance.

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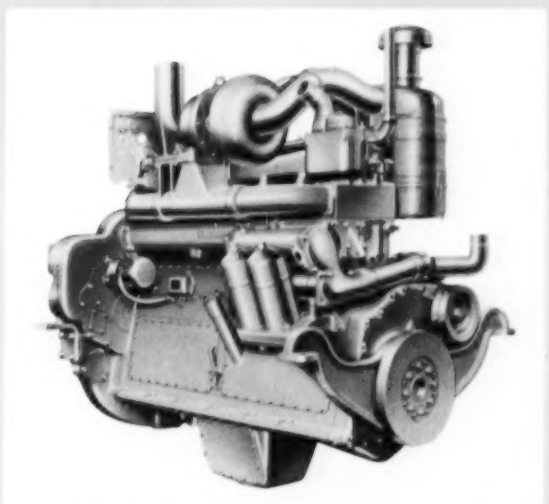
Two types of drives are available, the exclusive Caterpillar oil clutch with six-speed (forward and reverse) transmission or a three-stage torque converter with 5:1 torque ratio. The transmission used with the torque converter has three speeds forward; two reverse. This option enables you to match the drive you want to your job requirements.



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6 speeds forward, 1.6, 2.1, 2.9, 3.9, 5.0, 6.8 m.p.h.
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Though new, the D9 is already a veteran. After exhaustive proving-ground tests, several D9s have been tested for over 19,128 hours on the toughest jobs in logging, construction, mining and quarry work. These jobs tested every square inch of this mighty new machine. The word from the field: "By far the best big tractor ever made."

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and easy to service!

From its one-piece welded steering clutch case-frame assembly, to its track shoes hardened by the "Water Quench" process, the D9 is the toughest crawler built. And it's designed for easy servicing. Oil clutch, torque converter, transmission case and steering clutches can each be removed individually without disturbing other components. Hydraulic track adjusters are among the many other features for fast, easy adjustment and service work.

Brief specifications

Length: 17' 10¼"
Width: 9' 11¼"
Height: 8' 9"
Gauge: 90"
Weight: 54,000 lb. approx., dry
56,200 lb. approx., operating

Easy to operate!

- The independent "live-shaft" drive for cable controls makes operation smoother, easier.
- Hydraulic boosters provide both power steering *and* power braking.
- Adjustable seat, all-around visibility, easy access to all controls make operator's job simpler.
- Important new 7-roller track frame improves stability, flotation and ride.
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Equipment

New CAT®-built 'Dozers for the D9: the No. 9S Bulldozer, modified straight blade; the No. 9A Bulldozer, angling blade.

New Cat-built Cable Controls: the No. 29 rear-mounted, double drum; the No. 30 front-mounted, single drum.

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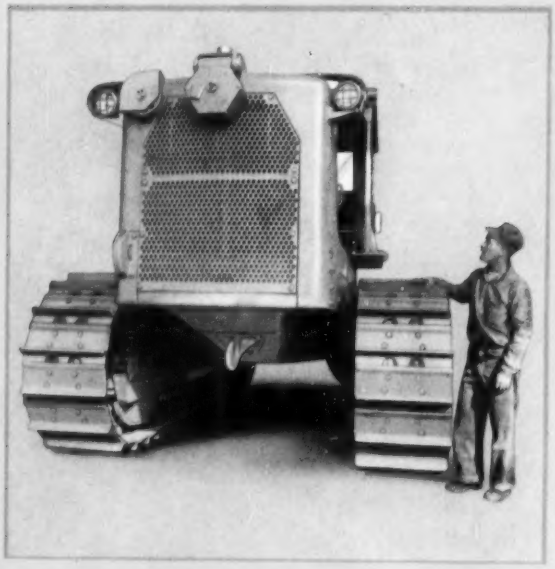

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DELIVERS 79 YARDS OF CONCRETE PER HOUR 8 STORIES UP

Handling lifts in a three-well tower, an efficient American 3-drum Hoist provided plenty of speed and power to meet a tight construction schedule on the Bon Marche Department store addition in Seattle, Washington. The hoist delivered up to 79 yards of concrete per hour in a 36-cubic-foot rollover bucket. A man-lift and a material elevator were used in the other two wells. When the four new stories are completed, the Bon Marche will be the largest store of its kind west of Chicago. Once again, the high production and unequaled efficiency of American Hoists have helped record another "on schedule" performance in modern construction annals. For factual, helpful information on how American's line of equipment can help speed production on your jobs, see your American distributor, or write American Hoist & Derrick, St. Paul 1, Minnesota.

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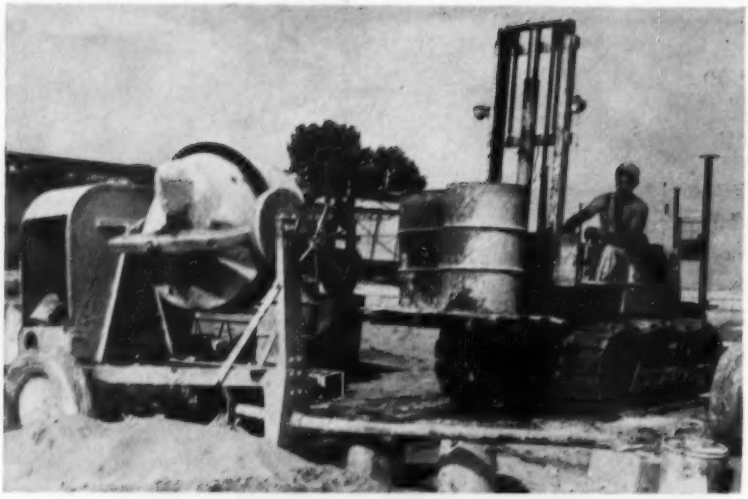


Small Fork Lift Tractor...

Proves Versatile Tool...

For Midwest Builder

"OUR TRACTOR meant the difference between making a profit and losing money on this shopping center." So said Orville Mickelson, job foreman. "Because of all the rain we had, we would have lost at least six weeks without the machine. It carried all our building materials through as much as 18 in. of mud."

The job Orville was talking about was a 100x310-ft brick, block and steel supermarket and shopping center at Hales Corner, Wis. The contractor was Orville's son, Del Mickelson, of Milwaukee. The tractor was a 30-hp American Terratrac M-3 with interchangeable fork lift and dozer blade. (See cover photo.)

Mickelson ran into trouble at the start of the job. Just after the basement was dug, the rains came. A two weeks' downpour made a lake of the excavation. Pumps succeeded in removing most of the water, but 1½ ft of sticky clay mud remained at the bottom, and seepage from the surrounding saturated ground kept it wet.

Handles Material on Pallets

Mickelson couldn't wait for the hole to dry out, so he started right in on the foundation. His fork-lift equipped tractor carried full pallets of concrete blocks down a dirt ramp into the basement and through the mud to masons laying up the wall. It also carried 1-yd, 2,800-lb tubs of mortar.

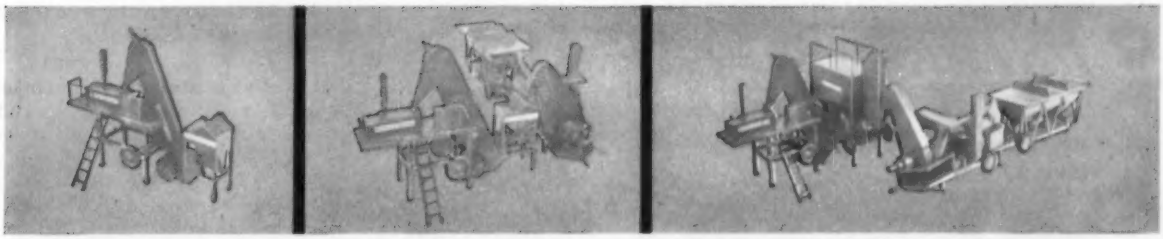
As the supermarket progressed, the Terratrac kept up with 15 to 20 masons. It unloaded trucks, and stockpiled and lifted to the scaffold more than 35,000 concrete blocks and 34,000 bricks.

Block was delivered from the yard on pallets of 45 12-in. or 60 8-in. units, weighing 2,880 and 2,700 lb respectively. It took the tractor an average of less than 10 min to unload a truck and stockpile six pallets in convenient locations on the job. Bricks were delivered loose, but were piled 200 to a pallet at the job. When block or brick was needed, the crawler transferred pallets right to the scaffold.

The tractor also took care of unloading bagged cement from delivery trucks (the job used 90 bags daily), hauling mixing water from the nearest source (150 yd away), and finally moving the 2,800-lb mortar tub to the scaffold.

Between these jobs the Terratrac set steel beams and lintels,

(Continued on page 80)



Cold Mix
Over 50 tons per hour with the 840-B *Mixer.*

Intermediate Hot Mixes
Up to 45 t.p.h. with *Mixer and Dryer.* (Shown with Cold Feeder.)

High-type Multiple Aggregate Mixes
Up to 45 t.p.h. with *Mixer, Dryer and Gradation Unit.* (Shown with Cold Feeder.)

NEW . . . Big Plant Flexibility at Low Initial Cost

WITH THE

NEW Barber-Greene 840-B Bituminous Plant

For a realistic low-cost initial investment you can have a plant that has the versatility for all kinds of jobs . . . from driveways to highways. The new 840-B interlocks aggregate and bitumen feeds for constant correct proportioning. The new, longer twin-shaft pugmill assures thorough mixing and increased capacities. Hydraulically operated pugmill discharge hopper allows plant to operate between trucks, and prevents mix segregation. The new high discharge lets trucks drive right under the hopper . . . eliminates a truck pit or special loading conveyor.

And this plant can travel. All units are mounted on pneumatic tires for towing at truck speeds. Adjustable jacklegs speed plant setup . . . eliminate cribbing.

Choose the Plant to Meet Your Needs

For an attractive initial cost you can have the new 840-B Plant you require. The mixer alone will set you up to produce stabilized base and cold bituminous mixes. Then, by adding other integrated Barber-Greene units—such as the dryer, gradation control, and dust collector, your plant can produce mixes to meet any specification. Check this new money-maker today.

55-4A-8

Barber-Greene

AURORA, ILLINOIS, U.S.A.

BG

WRITE for INFORMATION

descriptive literature . . . sound movies

cost studies . . . nearby job inspection . . . plant layouts

Built to Last Longer on the Toughest Jobs!

GOODALL
CONVEYOR BELTING

"SUPER TRIPLE-S"

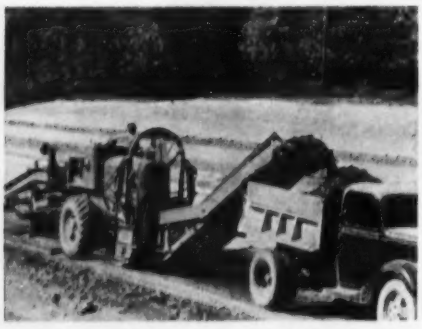
Conveyor Belting at its best . . . for super-severe service. Built to handle crushed stone up to 10" and other highly abrasive bulk materials, wet or dry, particularly on long center hauls where tension is high and extreme flexibility is required. Weather-resistant cover. Tensile strength, friction and other details determined by specific requirements.

"TRIPLE-S"

Designed for severe service but where weight of bulk material and length of carry do not demand "Super-SSS" quality. Recommended for crushed stone up to 6" or 8", abrasive ores, etc.

"LACROSSE"

A perfectly balanced, quality belt for all but the most severe conditions. Used for handling sand, gravel, shells, ashes, etc.



GOODALL MUCKER BELTS

"Wear King" Brand. Developed especially for use on Conway Mucking Shovels in tunnel excavating, and employed on most of the largest modern tunnel jobs.

GOODALL GRADER BELTS

"76" Brand. For many years, the Contractor's best assurance of long, trouble-free service on heavy-duty Elevator Road Graders.

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GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

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Est. 1870

SMALL TRACTOR PACES BUILDING JOB **Continued from page 78**

moved steel scaffolding and planks, handled roofing materials, and pushed trucks when they got stuck in the mud.

Mickelson also equipped his M-3 with a bulldozer blade. With this it leveled ground before scaffolds were erected, to cut down the time required for blocking. It also cut sidewalks and did grading and backfilling. Changing from fork-lift to bulldozer took less than 10 min.

Mickelson's experience on this project proves that savings can be obtained with mechanical materials handling. He estimates that, in handling enough materials to keep 20 masons busy, his fork-lift-equipped tractor did the work of three men using hand labor methods.

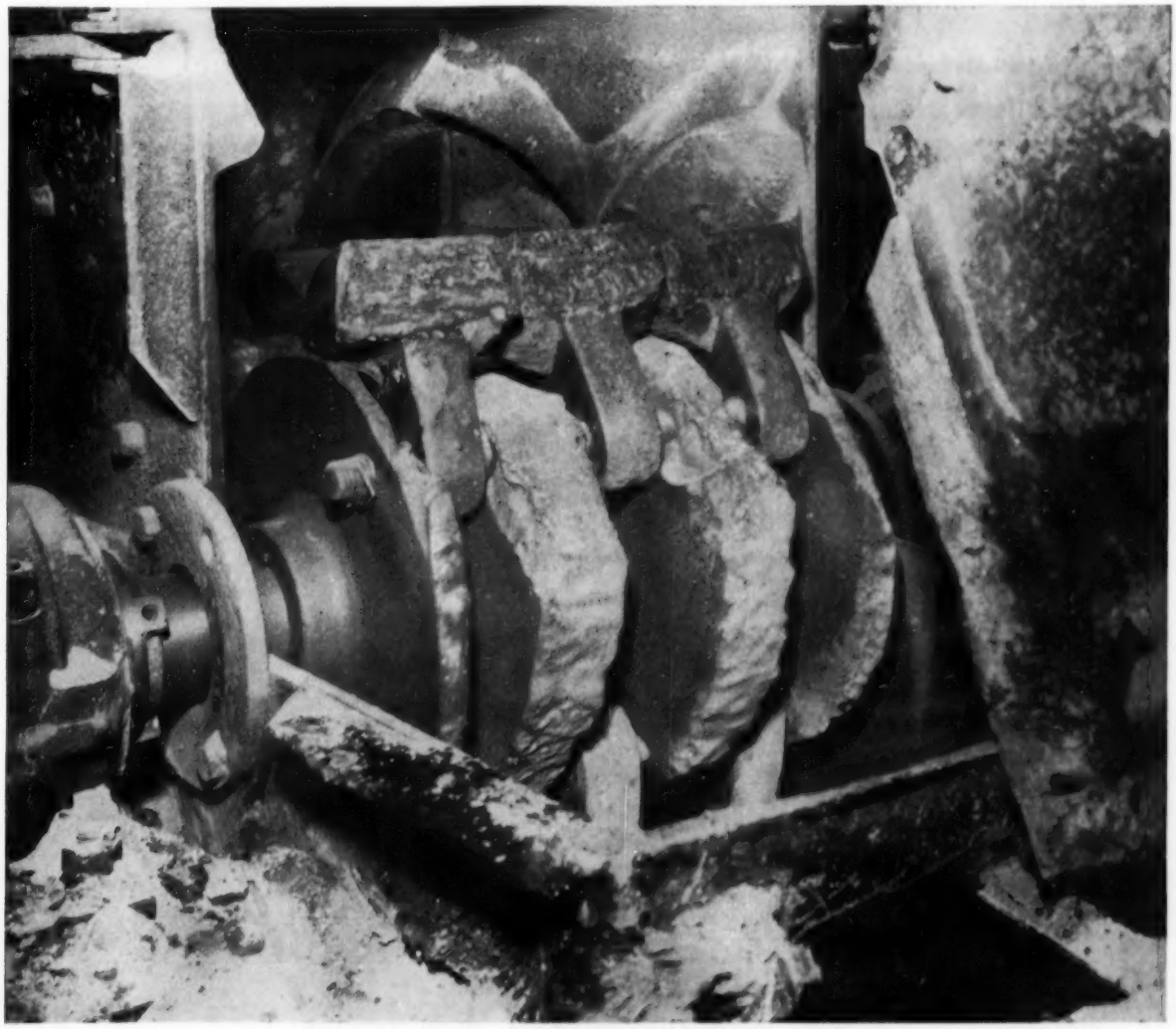
Saw Manufacturer Gives Trade-in Allowance

MALL TOOL CO., is now allowing a $20 trade-in credit on any old portable saw, regardless of its make, model or condition, to be applied toward the purchase price of a new Model 92 electric saw. The Model 92 is an all purpose speed saw for heavy-duty construction, priced for sale at $160.

Driven by a powerful heavy-duty ball-bearing universal motor, the saw cuts up to 3¼ in. deep with a 9½-in. blade. At 45 deg it cuts 2½ in.

The Model 92 has an ac-dc 25 to 60 cycle motor, 115 v (230 v. optional) and an amperage rating of 11. It is 16½ in. long. Included with the saw are a 9½ in. rip-cross cut blade, wrench, mill file, file handle, lubricant, steel carrying case, 15-ft cord, plug and ground.—Mall Tool Co., 7725 S. Chicago 19, Ill.

(Advertisement)



The periphery of the hammer mill rotor discs pictured here is regularly maintained with Coated Tube Stoodite, a high alloy electrode providing extreme wear resistance.

HOW TO GET MORE FROM YOUR HAMMER MILLS

Crushing decomposed rock and clay to produce material for wet-finished brick is a rough job and mighty tough on mill hammers. The Chattahoochee Brick Company in Chattahoochee, Georgia, has established a maintenance procedure that is producing more material at considerably lower cost by the use of Stoody alloys.

The raw material is dry-crushed in a pair of double rotor hammer mills. The problem, as usual, is to maintain the corners on hammers and keep them out to size as long as possible. The corners and edges of the hammer are, of course, subjected to severe impact and abrasion. At Chattahoochee Brick Company *new* manganese hammers are capped with an overlay of Stoody 21. As corners become rounded and the efficiency of the mill drops off, the hammers are pulled and turned over to the weldor for rebuilding.

Worn hammers as shown in the illustration are brought back to size with Stoody Manganese and the entire wearing area is hard-faced with Stoody 21. Records show that some hammers have been rebuilt and returned to service as much as 20 times. Thus the hard-facing program shows a remarkable saving in replacements as well as in downtime, and produces a greater volume of usable, properly sized particles.

Your Stoody dealer would be glad to advise you on the maintenance of your crushers and other heavy equipment subject to costly wear. Check the yellow pages of your telephone book or write to the company for complete descriptive literature.

STOODY COMPANY
11972 East Slauson Avenue
Whittier, California

DIESEL AND GASOLINE ENGINE OPERATORS

A NEW PM TOOL

ADC* Oilprint Analysis

CHECKS CRANKCASE OIL IN MINUTES

Shell Research gives you new oil-change yardstick—

Now—operators can test crankcase oil in the short time allotted for refueling and crankcase oil checks. The Shell ADC Oilprint Analysis gives a practical and accurate oil evaluation in minutes.

ADC Oilprint Analysis means big savings when used in your preventive maintenance program . . . gives valuable information on engine and oil conditions. It answers the question "When do I change my oil?" thus eliminating the draining of usable oil and the risk of using oils loaded with contaminants.

See for yourself how the new Shell ADC Oilprint Analysis can save you money in preventive maintenance. Let us show how you can use this new service for your equipment.

SAVES... Time, Money, Engines, Oil

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SHELL OIL COMPANY,

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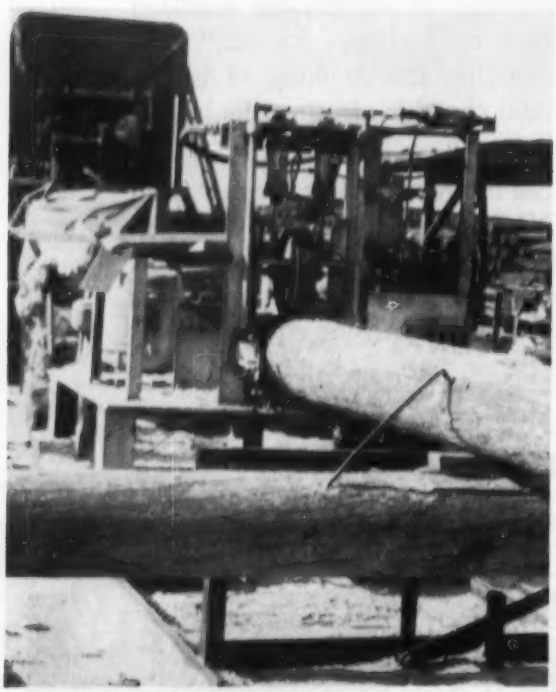
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

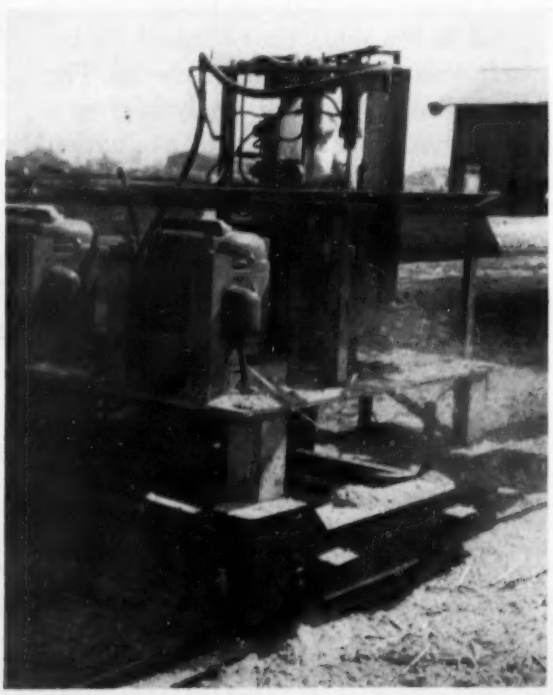
SHELL

Splice 160-Ft Timber Piles for Fenders

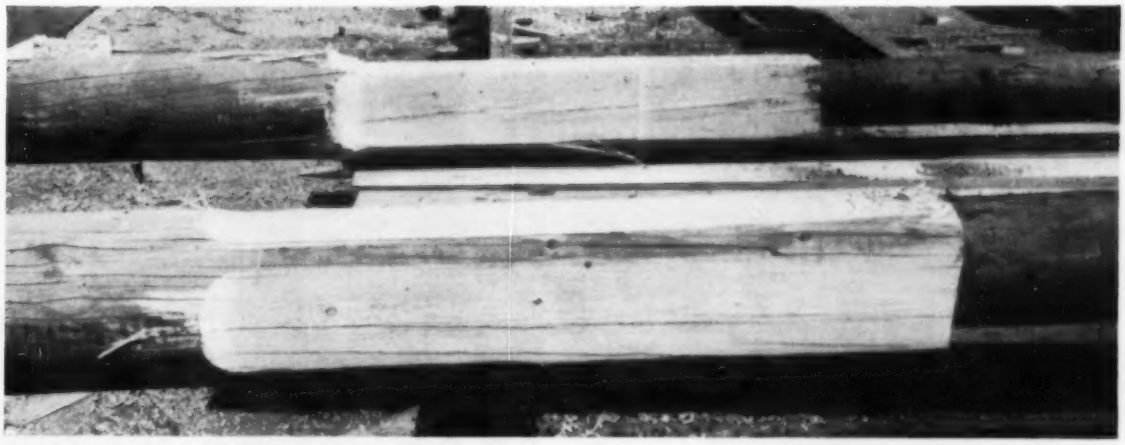
• Spliced timber piles 160 ft long are being driven to protect the piers of the Richmond-San Rafael Bridge over an arm of San Francisco Bay (CM&E, Feb. '55, p 56). The long piles have an untreated 65-ft bottom section spliced to a 95-ft creosoted top, and are driven in one piece. In all, 1,448 piles and a million board feet of treated timber are being placed as fenders for eight piers. Shown step-by-step in the accompanying photos is the manner in which contractors Ben C. Gerwick Inc. and Peter Kiewit Sons' Co., along with supplier J. H. Baxter & Co., are handling the job.

LONG PILE IS LIFTED into leads of floating rig in preparation for driving as part of fender system to protect piers of California bridge. Timber pile is 160 ft in length.





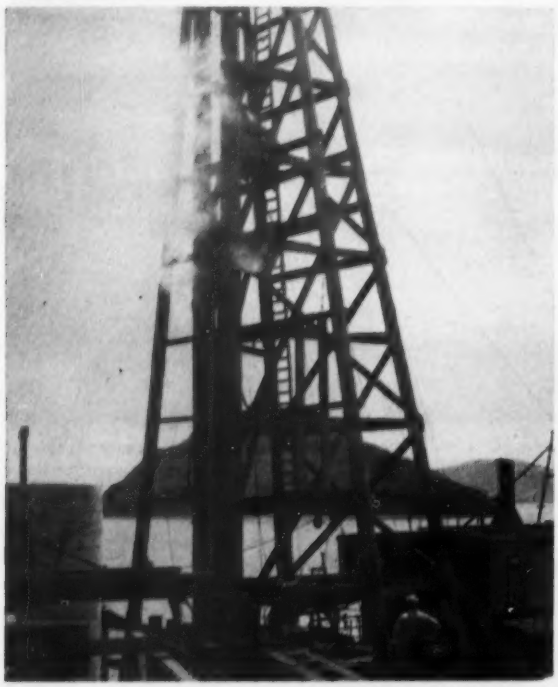
1 UNTREATED PILE'S BUTT IS SHAPED to square section by special machine developed by J. H. Baxter & Co., which is supplying piles and timbers for pier fender system. Rig's two motors power two rotating shaving heads that cut wood as machine is pushed into stationary pile. For deep cuts on large pile butts, two passes are required. Piles are rotated 90 deg to complete squaring.



2 TREATED PILE'S TIP IS MATCHED to squared butt of untreated pile. Untreated member and splice will fetch up below mud line, hence will be protected from decay and damage by marine organisms. Upper pile section receives 12-lb. pressure creosote.

3 SPLICING TIMBERS ARE FASTENED to piles by eight ¾-in. black iron bolts and annealed washers. Ingersoll-Rand air-powered auger and impact wrench handle the job readily. Bottoms of 4x8-in. splicing timbers are beveled to minimize resistance to driving.

4 COMPLETED PILES ARE HANDLED, two at a time, by pair of locomotive cranes that provide four-point lift. Cranes take piles from Baxter's yard to tidal estuary, where they are made up into rafts. Tugs take rafts to bridge site *(More photos on next page)*



5 PILE IS DRIVEN easily by Vulcan No. 1 hammer in 100-ft leads of floating rig. Final driving resistance is only 15 tons. This insures a flexible fender system that minimizes damage.

6 FENDER TIMBERS ARE ATTACHED to driven piles held in position by temporary framework of light steel that serves as templet during construction operations. (J. H. Baxter & Co. photos)

Army Engineers Build Compacted-Snow Runway in 72 Hr

UNDER THE ADDED OBSTACLE of simulated combat conditions, the Corps of Engineers, U.S. Army, recently completed a 5,000-ft compacted-snow runway in 72 hr. Part of "Operation Snowbird", the job was north of Anchorage, Alaska.

Key to the completed job was a heater-mixer created by the engineers. The unit, pulled by a Cat D7 tractor, has tiller-like prongs that tear up several inches of snow and throw it into flames of eight giant torches. The snow is partially melted and returned to the surface where it is smoothed out by a rear drag blade on the machine.

Immediately following the mixer came compaction equipment that packed the snow from 40 down to 24 in. The compacted surface was hard enough that aircraft of the C-47 type could land safely.

The plan has been under study for the last 10 yr. And with improvements to be made in the future, the Corps of Engineers feels that snow compacted runways will be practical for heavier type planes.

HEATER-MIXER MACHINE helps compact a 5,000-ft snow runway in Alaska. It partially melts the snow and returns it to the surface, where it is compacted from 40 down to 24 in.

LORAIN MC-425

NEW 25 TON MOTO-CRANE®

ANOTHER LEADER FROM THE LEADER

2 CARRIER WIDTHS

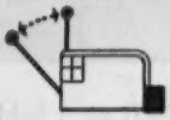
Now a 25-ton Moto-Crane with an overall width of only 96". Legal width in most states for over-the-road travel. Also available as Model MC-425W in 108" overall width for greater lifting capacities-on-rubber over the sides.

HIGHER CAPACITY TUBULAR BOOM

Square tubular chords and continuous tubular lacing increase strength and capacities yet reduce total weight in this quickly assembled, pin-connected boom. Plenty of capacity to travel with long booms over rear.

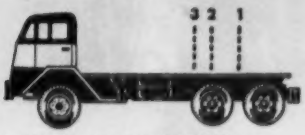
TILTING MAST GANTRY*

For easiest handling of long booms . . . tilts up or down as boom is raised or lowered to provide most efficient angle for boom hoist cable *at all times*. Standard 8-part boom hoist derricking gives slower, more precise boom control.



REMOVABLE COUNTERWEIGHT

Turntable and Carrier prepared for quick, easy counterweight removal. Reduces vehicle total weight for highway travel.



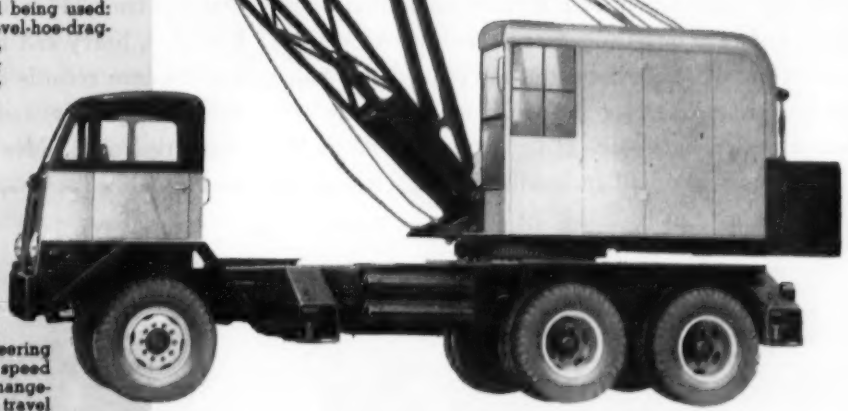
3-POSITION MOUNTING

Turntable mounting position can be selected to best fit the job and front end being used: (1) for proper clearances for shovel-hoe-dragline; (2) for general-purpose crane-clam application; (3) for 20 tons crane lifting capacity over rear on rubber.

DUAL REMOTE CONTROL*

Permits full air control from turntable cab of carrier engine throttle and clutch, carrier steering and air brakes, carrier travel at 1 speed forward or reverse. Quick, easy changeover from long range Moto-Crane travel to operator-controlled on-the-job localized travel.

*Extra Equipment



THE THEW SHOVEL CO., LORAIN, OHIO

It took a lot of rubber-tire crane "know-how" to build the MC-425 and MC-425W . . . to develop such big capacities at minimum weight and width . . . to provide so many operating and profit-making features . . . and Thew-Lorain alone has the vast experience that makes such advantages possible, due to the more than 35 years of rubber-tire experience they have acquired since originating the truck crane in 1918 . . . the leader still leads! The MC-425 and 425W are your proof.

SEE YOUR NEAREST THEW-LORAIN DISTRIBUTOR FOR THE NEWEST FACTS ON THE NEWEST LORAIN.

THEW LORAIN®

(Advertisement)

NEW BUCKEYE 403 A ladder-type ditcher designed specifically for foundation and service connection work. Small and easy to transport . . . Cuts squared corners and leaves no crumbs in the ditch . . . Crawler mounted for low ground bearing pressure and all-weather performance . . . Full range of bucket widths, 8" to 16" . . . Cuts to 5' depth. Can handle the toughest digging.

NEW BUCKEYE 315 Heavy-duty utility and pipeline ditcher that digs from 24" to 40" widths and to a depth of 6' . . . Powerful, heavy and rugged, the 315 has set amazing performance records on tough jobs. The photo above shows it quickly and easily digging through solid coral rock . . . Ideal for pipelines, gas and water mains, cables, sewers, ditches and other heavy work.

SPECIAL BUCKEYE 306 A special application for digging trench for roadside drainage where narrow shoulders and sloping banks prevent standard ditchers from operating. Offset digging wheel can dig trench in line with outside edge of crawlers. Used on Ohio Turnpike.

BUCKEYE HI-WAY WIDENER Digs up to a mile per day of clean, flat bottom ditch—uniform in width and depth and ready to receive material. Can remove broken concrete . . . Travels up to 20 m.p.h. under own power. The low cost method of handling side ditch problems.

(Advertisement)

GAR WOOD-BUCKEYE DITCHERS

LATEST DEVELOPMENTS IN DITCHERS

Over and over again comparative costs have proved to contractors that there is no such thing as economical 'all-purpose' equipment . . . If specialized jobs are to be done at lowest possible cost, specialized machines must handle it—and no machine handles a ditching job better than a Buckeye Ditcher!

For over 50 years Buckeye has pioneered in the development of specialized equipment to dig ditches faster, better and at lowest possible cost . . . Although known and used in every part of the world, Buckeye engineering is never static—constant improvement and continuous advancement is the price of leadership.

The latest developments in the Buckeye line are illustrated and described on the page at left—but these new machines are but a small part of the *complete* Buckeye line . . . From the huge ''51', used on the biggest pipeline jobs, to a small machine for farm drainage work, Buckeye makes a machine for every possible ditching job! . . . Wheel type or ladder type—for wide cuts or narrow cuts—deep cuts or shallow cuts—there's a Buckeye that is designed to do the job exactly right, and at the least possible cost in the minimum amount of time.

Your dealer will gladly give you detailed information on the entire line—and show you how specialized equipment can pay off on faster, cleaner, more profitable ditching!

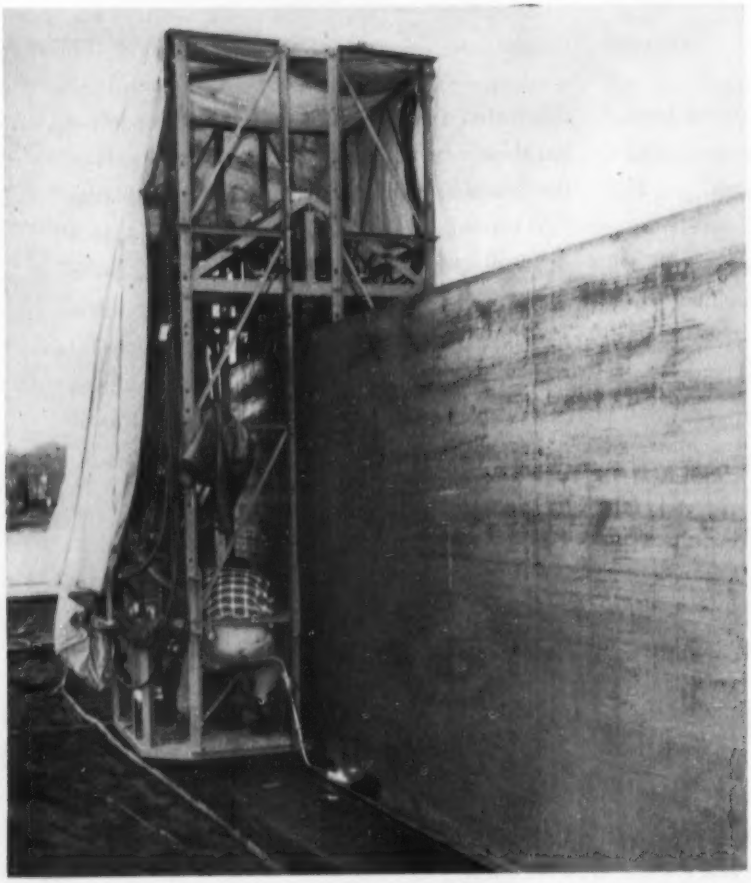
MODERN EQUIPMENT BUILT TO SOLVE MODERN PROBLEMS!

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

No. 522

Pickup truck pulls trailer carrying motor generators as...

Self-Propelled Cage Welds Wall Plates



CAGE STRADDLES bottom wall plate as automatic device welds joint at floor edge. Torch ahead of welder dries plate. Cage is propelled by ½-hp motor which drives flanged wheel.

A SELF-PROPELLED CAGE mounting an automatic welder speeded the erection of eight huge grain storage tanks in Portland, Oregon. Suspended from the top of the wall plate, the rig quickly welded horizontal butt joints in one pass. Full penetration was obtained by operating an electrode on each side simultaneously. Flux dams under each electrode were made by running a short inclined belt under the welding area.

Welding equipment consisted of two standard automatic Lincoln-weld heads, a complete vacuum pickup, and two 900-amp motor generators with two 35-v, 1-kw motor generators. The motor generators supplying welding current and control current were mounted on a two-wheel rubber-tired trailer and towed around the tank wall just behind the welding cage by a light truck. The flux used was 760 and the wire, L-60.

The oval-shaped tanks with rounded roofs are 195 ft long, 135 ft wide, and 75 ft high. Walls are made of five courses of steel plate. The first four are each 8 ft high and the fifth varies in height from zero at the tank sides to 10 ft at the ends. The first four courses are made of 8x25-ft plates. The bottom course is 7/16 in. thick; the second course, 5/16 in.; and the top three courses, ¼ in. thick.

(Continued on page 93)

W. E. Logan & Sons, Muskogee, Oklahoma

"4 years before overhaul with Cities Service lubricants!"

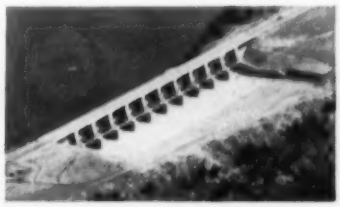
Builders of dams, airports, and a large percentage of the roads in Oklahoma, W. E. Logan & Sons use as many as 84 pieces of equipment on one job at one time.

Says Logan's Master Mechanic, Charlie Wills, "Often we have as many as four major road jobs going at once, and we average 240 hours a month on every piece of equipment we've got, year around."

Grueling work? You bet! And for the last 20 years Logan has relied on Cities Service to help get that work done. Here's the balance sheet: Using Cities Service C-300 Motor Oil, Trojan Greases, and Trojan MP-140 Gear Oil, Logan's D-8 Cats run four to five years before major overhaul. After four years, bearing inserts are worn less than .003 inches, liners less than .007 inches. In addition, Trojan MP-140 Gear Oil has kept gear cases so free of sludge that after five years, paint inside the cases is "perfectly clean."

That's only part of Logan's story. But it's mighty important—and it may become part of your story when you start using the Cities Service line of highest quality petroleum products. Learn the whole profitable story. Contact your nearest Cities Service representative or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

Machines, machines, and more machines! W. E. Logan & Sons uses as many as 84 pieces on a single job, all Cities Service fueled and lubricated. Many use Cities Service Hydraulic Oils, too.



The Tenkiller Ferry Dam Reservoir in Oklahoma was one of Logan's biggest jobs. An earthen dam, it required moving 10,809,580 yards of earth, took 3 years to complete.

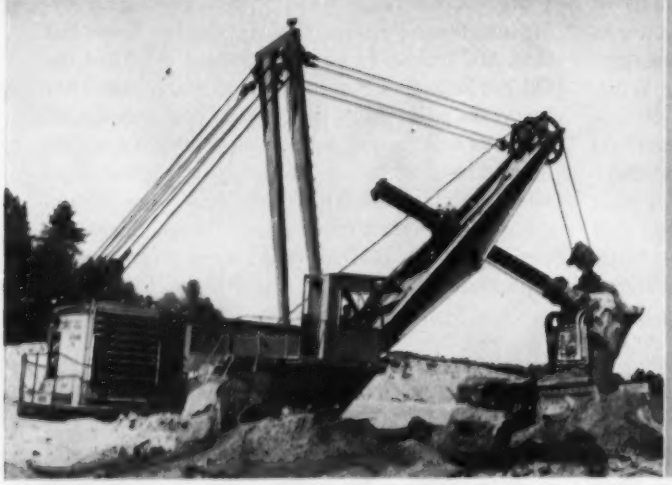
And always close by—Cities Service. For the past 20 years, wherever there's been a piece of Logan equipment at work, Cities Service Lubricants have been at work too.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

ROAD BUILDING?

Get the jump on competition with this 5½ yard Manitowoc 4500



FAST JOB-TO-JOB MOBILITY
FAST ON-THE-JOB ERECTION

INDIANA TOLL ROAD — Proof of Manitowoc's mobility and fast, economical erection on the job. Western Contracting Corporation of Sioux City, Iowa, unloaded and erected this 4500 in record time "between trains". Total unloading and erecting time was less than four days. Because of its narrow, low travel clearance and design, unit was shipped on a flat car without having to be completely dismantled. This 5 yard dragline with 140 ft. boom was assigned to excavate more than 200,000 yards of material.

BIG DIGGING CAPACITIES
FAST WORKING CYCLES

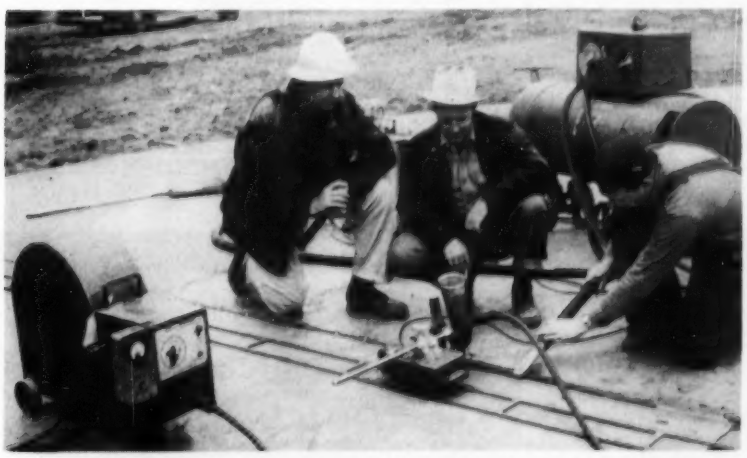
WEST VIRGINIA TURNPIKE — Latrobe Construction Co.'s 4500 Manitowoc shovel with 5½ yd. bucket moved 550,000 yards of rock in a 4-month period — averaging 6000 yards per eight-hour day, with performance reaching a maximum of 778 yards per hour in "well shot" rock.

More and more successful road building contractors across the country are making the Manitowoc 4500 the "big tool" on their big jobs. When you have big yardage to move — move it fast with a giant Manitowoc 4500. Only the "4500" has the perfect combination of big machine capacity and the mobility and fast, simple portability of small machines. It can be easily trailored from job-to-job or transported by flat car. On the job it can be erected in a matter of several days and is easily maneuvered from one location to another without trailing a cable. Handles big rock without picking or scratching. With one 4500 instead of several small machines, you cut down on the number of operators and oilers on the job. Get the edge on competition — give yourself a "break" on your next bid — figure on a Manitowoc 4500. Write Manitowoc Engineering Corp., Manitowoc, Wisconsin.

MANITOWOC
SHOVELS 1-5 YD. Speed Crane CRANES 20-100 TON

CAGE WELDS WALL PLATES . . . Continued from page 90

BOTTOM-PLATE WELDING goes on despite bad weather. Welding plays important role in fabrication and erection of three center towers and rafter trusses which support conveyors.



FLOOR-PLATE WELDING is done manually with Lincolnweld semi-automatic equipment. Welding gun is mounted on a self-propelled cutting buggy. Plates are lap welded.

Floors are 3/16-in. plates. They are set on a concrete retaining rim which supports a sand fill. All floor plates were lap welded, with semi-automatic hidden-arc equipment. Predetermined sequences were followed to minimize distortion of the vast watertight floor areas.

Much of the work was done under adverse weather conditions. This called for covering the wall cage with a tarp and using a torch to dry out the plate prior to welding. Despite the cold and rain, American Pipe and Construction Co. was able to keep up to schedule.

The roof of each tank is supported by three prefabricated towers in the center and two steel-column-supported rafter trusses, 46 ft long, one on each side of the tank. The three center towers support a bridge truss approximately 110 ft in length which, in turn, supports all the overhead conveyor equipment.

Both the towers and rafter trusses are of all-welded construction. Some bolts were used for erection purposes, but each bolt was tacked to prevent loosening under the exceptional vibration caused by the conveyor system. The towers were anchor-bolted to massive concrete footings. All anchor bolts extend through the floor plating to provide watertight joints. The principal structural members in the towers are 6x6x¾-in. angles.

Welding also joined the side

(Continued on page 97)

FOR A MOBILE EMERGENCY RIG

WHEN machinery, trucks or tractors get mired, stuck or submerged valuable equipment is idle or endangered . . . and that costs money. With a tractor-mounted Carco winch on the job you can move to the trouble speedily. The added "reach" of the Carco winch line lets you get to the equipment to be rescued. And the rugged pulling power of the Carco winch . . . double the drawbar pull of the tractor itself . . . does the rest of the job. Carco winches are engineered for rough, tough work . . . long wearing, constant mesh gear trains transmit tractor power efficiently . . . brakes hold firm . . . concealed cable controls eliminate exposed levers and rods. See your nearest Carco dealer. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Wash. Branches at Portland, Ore., and Franklin Park, Ill.

50TH ANNIVERSARY
PACIFIC CAR AND FOUNDRY COMPANY

WINCHES
For All Industrial Tractors

CARCO

ELECTRIC POWER

DELCO-REMY A.C. GENERATORS FOR EXTRA-HEAVY ELECTRICAL LOADS

Delco-Remy's new 6- and 12-volt A.C.-D.C. charging systems are the answer to the *extra-heavy* electrical demands of late-model contractors' trucks, cars, and other vehicles equipped with two-way radio, floodlights, or other special electrical units. High wattage output is ample for heaviest electrical loads . . . generators pick up discharged batteries quickly in emergencies. Delco-Remy A.C.-D.C. charging systems are unexcelled at engine-idle . . . furnish up to 180 amperes at higher engine speeds . . . are dependable under the most rugged operating conditions at all engine speeds.

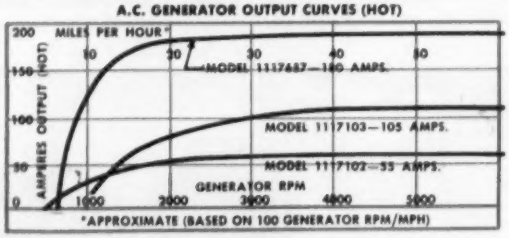
Application packages, for both 6- and 12-volt generators, complete with installation instruction sheets for popular makes of cars and trucks, are available. Conversion is simple. See your nearest United Motors distributor for additional data.

A.C. GENERATOR PERFORMANCE DATA (HOT)

Model	Volts	Cut-in RPM	Engine Idle Amperes*	Maximum Amperes	Power Watts SAE	Recommended For
1117102	12	525	39	55	825	All speeds.
1117103	12	960	5	105	1575	All speeds.
1117657	12	550	120	180	2700	All speeds.
1117062-3-4	6	750	38	90	720	All speeds.

*APPROXIMATE (BASED ON 1000 GENERATOR RPM)

A.C. GENERATOR OUTPUT CURVES (HOT)



*APPROXIMATE (BASED ON 100 GENERATOR RPM/MPH)

DELCO-REMY D.C. GENERATORS FOR MEDIUM-TO-HEAVY ELECTRICAL LOADS

Delco-Remy's 12-volt extra-output D.C. generators are an economical answer to the electrical needs of late-model contractors' trucks, cars . . . other vehicles with additional lights, two-way radios, or other special electrical equipment in medium- to heavy-duty service. Delco-Remy extra-output D.C. generators are low in cost, simple to install, economical to maintain. Performance data on Delco-Remy extra-output D.C. generators are shown at the right.

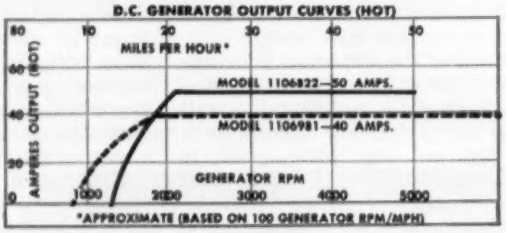
For further details and application data, see your nearest United Motors distributor.

D.C. GENERATOR PERFORMANCE DATA (HOT)

Model	Volts	Cut-in RPM	Curb Idle Amperes*	Maximum Amperes	Power Watts SAE	Recommended For
1106822	12	1300	0	50	750	Low to Medium Speeds.
1106981	12	825	14	40	600	Low speeds & idling.
1106757	6	820	†	55	440	Medium to high speeds.
1106758	6	560	26	45	360	Medium Speeds and Idling
1106977	6	610	28	55	440	Low speeds & idling.

*APPROXIMATE (BASED ON 1000 GENERATOR RPM)

D.C. GENERATOR OUTPUT CURVES (HOT)



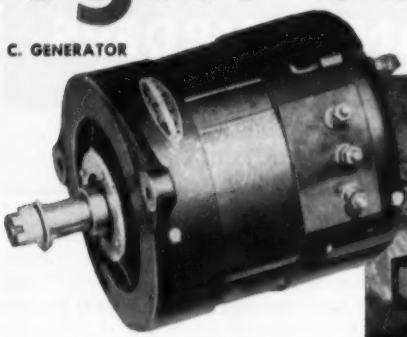
*APPROXIMATE (BASED ON 100 GENERATOR RPM/MPH)

Delco-Remy
ELECTRICAL SYSTEMS

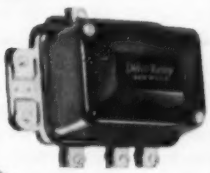
DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

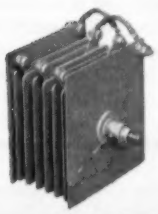
right for the job

A. C. GENERATOR



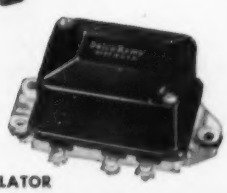
REGULATOR





RECTIFIER

D. C. GENERATOR



REGULATOR

A GENERAL MOTORS PRODUCT GM GENERAL MOTORS UNITED SERVICE MOTORS **A UNITED MOTORS LINE**

DISTRIBUTED BY WHOLESALERS EVERYWHERE

5 SUPERIOR WAYS OF HANGING FORMS FROM STEEL BEAMS AND GIRDERS

(NOT FIREPROOFED)

Especially designed to meet field conditions on BRIDGE SUPERSTRUCTURES

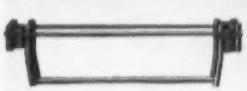
Standard Coil Hanger Frame

When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts is 10,000 lbs., or 5,000 lbs. per bolt.

Plate Hanger Frame

FOR ADJUSTMENT FROM TOP OF DECK

The Plate Hanger Frame, shown at left, has metal plates with a punched hole instead of wire coils. The Coil Bolts are passed through the holes and secured from above with coil nuts. The plates provide adequate bearing for the nuts, which being square will not turn when the bolt is removed. The installation and necessary adjustment to bring the deck forms tight against the flange are from above the deck. The total safe load on both coil bolts is 10,000 lbs., or 5,000 lbs. per bolt.

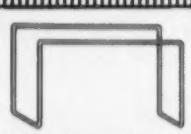


Special Hanger Frame

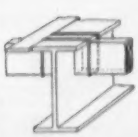
AT LOW HAUNCH

AT HIGH HAUNCH

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch on the upper flange, which varies in depth. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" Coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail at left.) Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt .

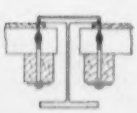


Wire Beam Saddle



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

Coil Beam Saddle



Superior Coil Beam Saddles are used, as shown at left, where hanger wires may be cut after stripping the forms. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

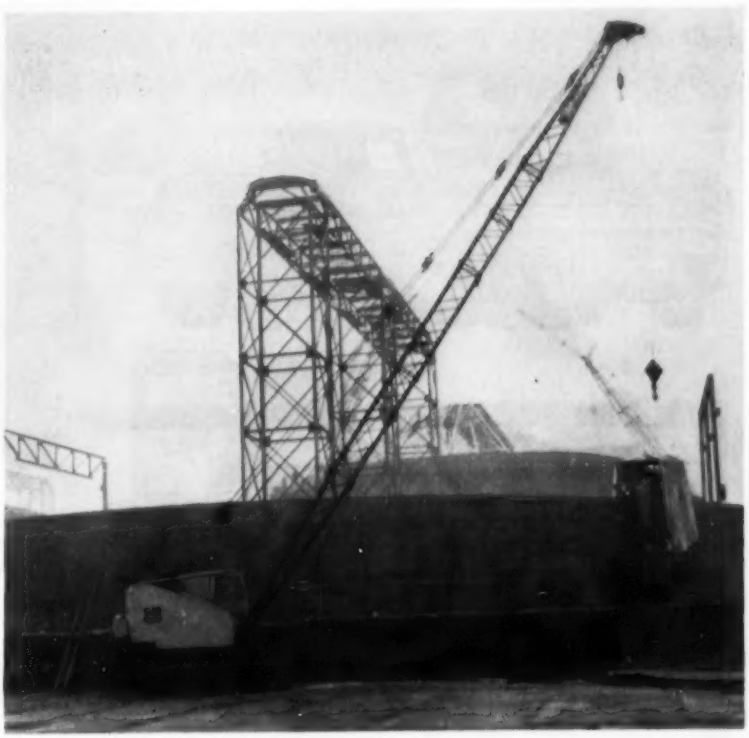
New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

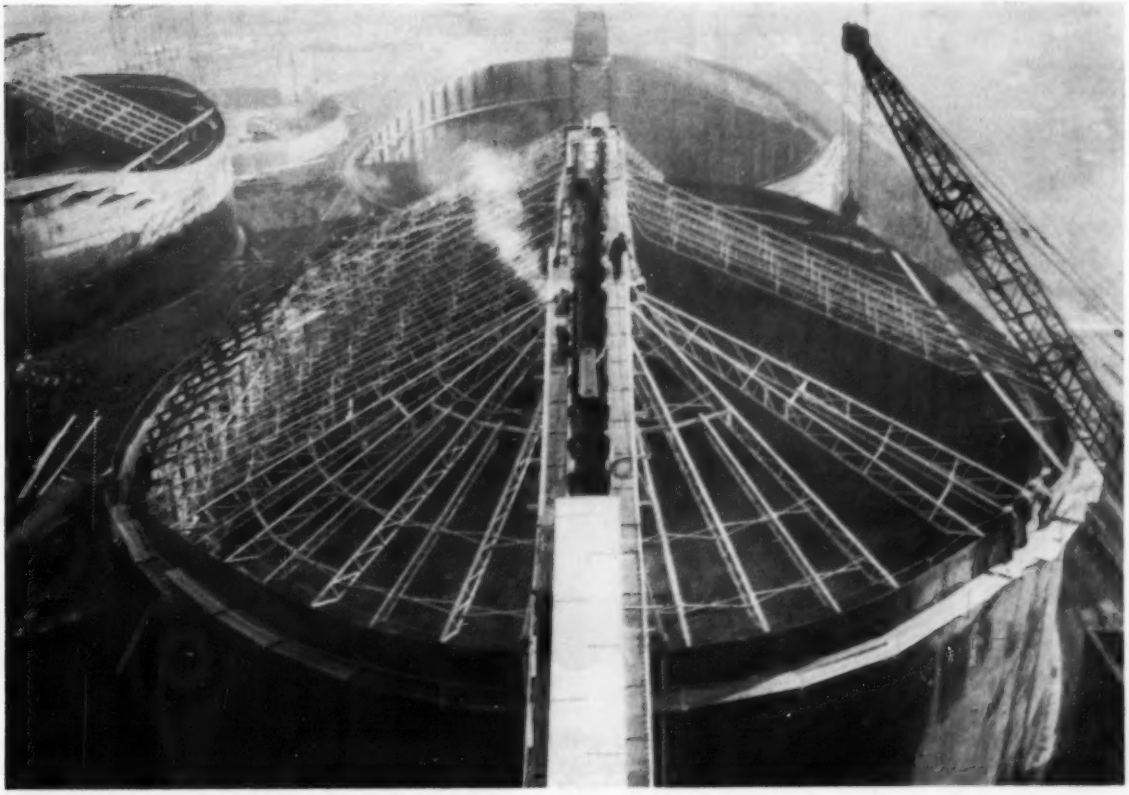
supports to both the towers and tank walls. All base plates, gussets and attaching angles were welded. Some 70 stiffeners on each tank join the rafters to the side supports.

The roof was made of 3/16-in. steel plate. These roof plates were lapped against the weather and welded on the horizontal joints with 3/16-in. Jetweld 1, an iron powder-type electrode. Speeds with this electrode were considerably faster than those obtained with the conventional 7/32-in. E-6012 electrodes used on all transverse joints.

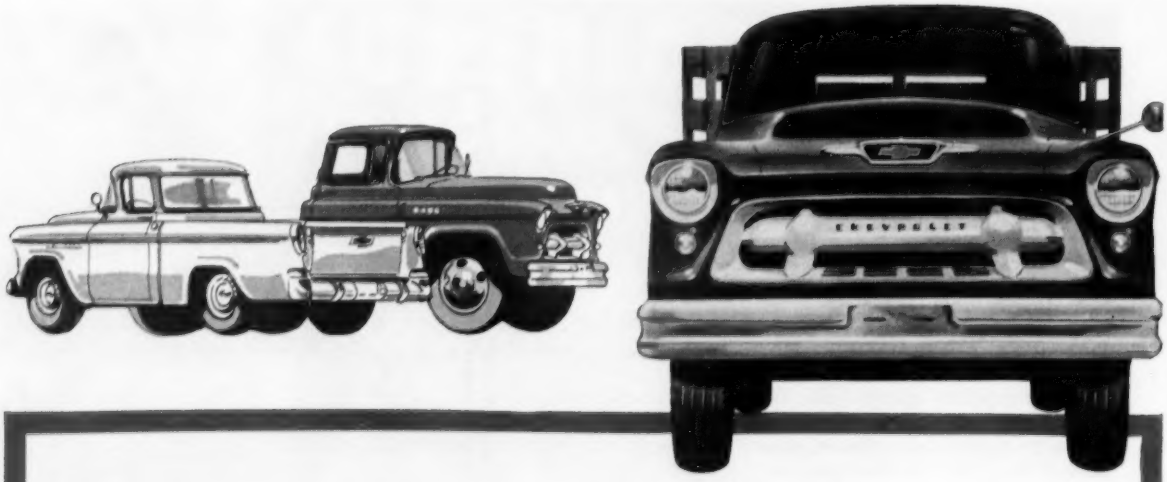
The conveyor system for the tanks, which required the use of the large towers and trusses, consists of two 3-ft belts in each row, each capable of dumping 500 tons per hr into the center of the tanks. A Shovelveyor shovels and distributes the grain inside of the tanks. Another Shovelveyor serves to empty the tanks, moving the grain to a draw-off belt which carries it to the main mill conveyor system. Thus, both the loading and unloading systems are in duplicate, permitting simultaneous loading and unloading of 1,000 tons per hr with a total of four 940-ft belts.



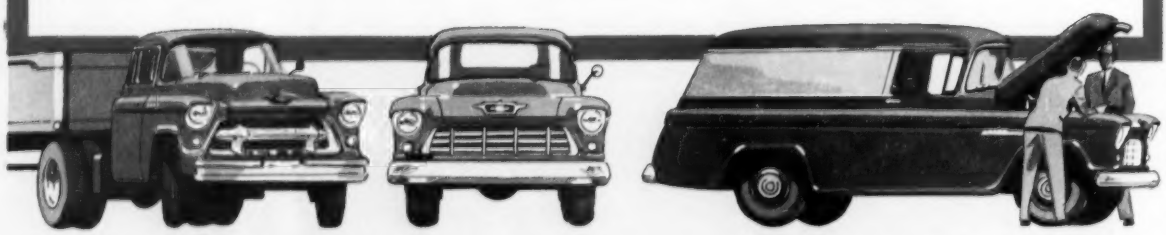
SECOND COURSE OF WALL PLATES is also welded by self-propelled cage. The wall's highest horizontal seam, however, is welded manually from both sides simultaneously.



ROOF TRUSSES are set in place over huge grain storage tank. Roof plates 3/16-in. thick will cover trusses. They will be lap welded against the weather. Conveyor system over tank roof consists of two 3-ft belts, each capable of handling 500 tons per hr.



NEW CHEVROLET *Task-Force* TRUCKS

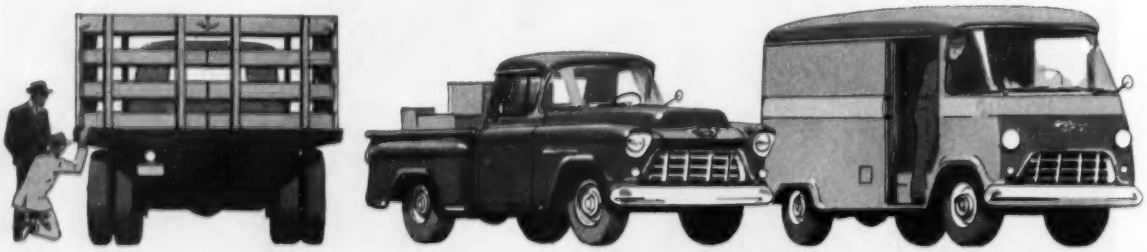


A new kind of truck styling

It's Work-Styling—an exclusive development in truck design with two distinctively different styling treatments. On the job, your truck "looks the part" and becomes a profitable advertisement on wheels for you and your business.

New "high-voltage" engines

Six of them! Each with a modern 12-volt electrical system for surer year-round starts and increased generator capacity—plus a long list of other new advances. They're the last word in smooth, quiet and thrifty truck power.



New frames of standard width

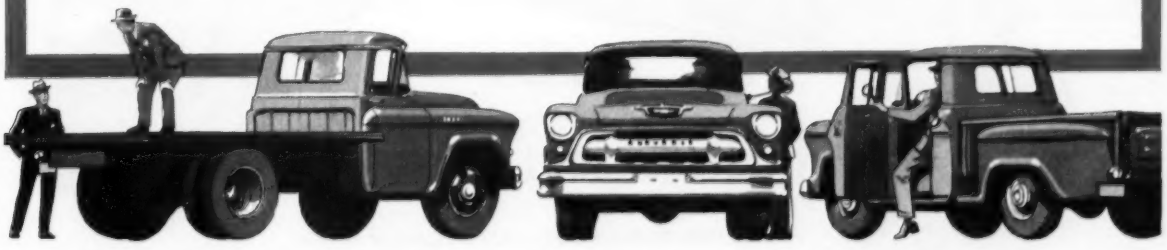
All models now have new ladder-type frames with full-length parallel side members for greater rigidity and longer truck life. Now, too, these newly designed Chevrolet frames are all 34 inches wide to accommodate special body installations.

New Overdrive—Truck Hydra-Matic

For even bigger gas savings and less engine wear, new Overdrive is available on all ½-ton models at extra cost. Hydra-Matic, Chevrolet's thrifty automatic truck transmission, is optional on ½-, ¾- and 1-ton models at extra cost.

CHEVROLET

They're setting the pace for the whole industry! Take a good look at them here... in the showroom . . . on the road. It won't take you long to discover that these are the most modern trucks on any job.

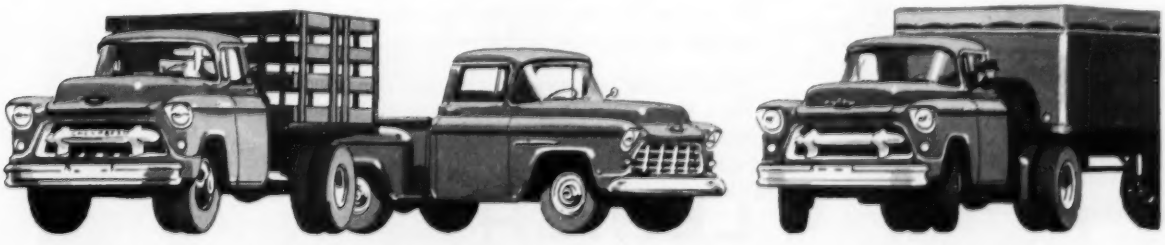


New 18,000-lb. G.V.W. capacity

The highest ever for Chevrolet! And that's good news for everyone with heavy hauling to do. For with this hefty hike to 18,000 pounds Gross Vehicle Weight, Chevrolet brings its famous economy and dependability to new heavy-duty fields.

A cab as new as the view

New Sweep-Sight windshield—plus more glass all around—for a wider, safer view. New High-Level ventilation for greater driver comfort. New softer seats. New, more durable cab construction. New concealed Safety Steps that stay clear in all weather.



Power Brakes standard on 2-ton models

This great power helper increases driving safety . . . reduces driver effort. You stop with up to one-third less pedal pressure—and you do it right now! Chevrolet Power Brakes are standard equipment on 2-ton models —optional at extra cost on all others.

There's more to tell, a lot more

Stop in and let your Chevrolet dealer give you the complete "all-new" story. There are many more good things to discover about the New Chevrolet Task-Force Trucks! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Sunbeam goes forward faster with
Lehigh Early Strength Cement

PLANT #1 1917-1941. 329,840 sq. ft.
#2 Completed 1949. 173,160 sq. ft.
#3 Completed 1950. 156,640 sq. ft.
#4 Completed 1951. 134,640 sq. ft.
#5 Completed 1952. 163,760 sq. ft. (*Lehigh Early Strength*)
#6 Completed 1953. 164,250 sq. ft.
#7 Completed 1954. 184,260 sq. ft. (*Lehigh Early Strength*)

(Artist's drawing of Sunbeam expansion, Chicago, Ill. 1941–1954)

Owner: SUNBEAM CORPORATION, Chicago, Ill.
Contractor: CAMPBELL-LOWRIE-LAUTERMILCH CORP., Chicago, Ill.
Architect: OLSEN & URBAIN, Chicago, Ill.

In 1949, Sunbeam Corporation's expansion shifted into high gear. Through careful planning and selection of the right materials, the architect and contractor kept this construction program rolling at a fast pace through all kinds of weather, year after year.

Their choice of Lehigh Early Strength Cement for midwinter work on addition #5, for example, resulted in *a saving of 35 days construction time and $14,000 in forms, curing and overhead costs.* Similar results were obtained from its use during cold weather construction of addition #7. On the other additions, built in moderate weather, the contractor used dependable Lehigh Portland Cement.

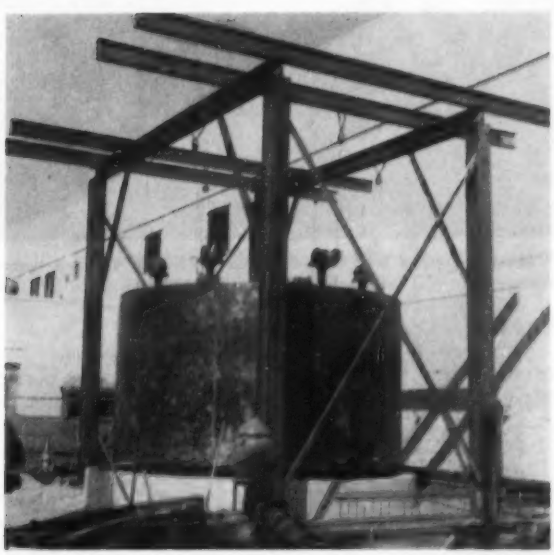
Whatever your requirements, there are Lehigh Cements to fit them. Our Service Department will be glad to help you with your specific problems.

LEHIGH
PORTLAND CEMENT CO.
Allentown, Pa.

LEHIGH EARLY STRENGTH CEMENT • LEHIGH PORTLAND CEMENT
LEHIGH AIR-ENTRAINING CEMENTS • LEHIGH MORTAR CEMENT

Hand winches operated by 6-man crew control speed of rising as ...

Steel Slip Form Lines Walls of Deep Shaft



HEADFRAME over deep shaft supports steel slip form with six cables. Form is 18 ft in dia and 10 ft deep. Lifting speed was about 2 ft per hr, with jumps of ½ in. every 2 or 3 min.

A STEEL SLIP FORM suspended by cables from a headframe lined a deep shaft with concrete in only 62 hr. Controlled by hand winches, the 10-ft deep form was raised about 2 ft per hr as concrete was placed continuously in the 12-in. thick shaft walls. Raising was done in ½-in. jumps every few minutes by a 6-man crew.

Before he began any concrete lining, however, the contractor had to complete some tricky shaft sinking. Vinnell Company, Inc., of Alhambra, Calif., had a contract to construct two 110-ft deep, 18-ft dia quenching pits at the Torrance, Calif. plant of Harvey Aluminum Co. Ground consisted of 20 ft of hard clay on 90 ft of sand. A few layers of loam and clay crossed through the sand.

Vinnell sunk both shafts by excavating with a 2½-yd clamshell bucket and lining with rings of commercial plates. The top 16 ft was excavated before any plates were erected. After the walls were trimmed with pneumatic spades to a 21-ft dia, complete rings of plates were set in place from the bottom of the 16-ft hole to about 4 ft above the top. This 4-ft projection acted as a protective barrier.

When all the plates were fitted into the top section, ⅞-in. bars were driven through them into the clay, and cement grout was poured between the plates and

INDIAN
DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular.

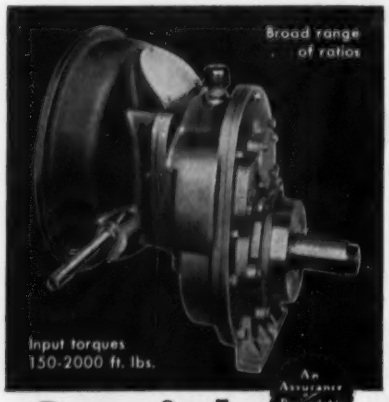
E-Z
5 gal. Knapsack Sprayer

For spraying oil on machinery and equipment to prevent rust, etc. 4 to 5 gal. capacity. 24 inch brass extension with brass adjustable nozzle for long or short distance spraying.

Send for circular

DISCOUNT IN QUANTITY LOTS

D. B. SMITH & COMPANY
"Choice for Quality the World Over"
450 Main St., Utica 2, New York



Special heavy-duty

- Transmissions
- Reduction Units
- Mechanical Drives for Torque Converters

Cotta Transmission Co., Rockford, Illinois

COTTA
HEAVY-DUTY
TRANSMISSIONS

"Engineered-to-order"

DEEP SHAFT is supported with Commercial liner plates. After lift is excavated, plates are bolted to bottom ring. Ladders with offset platforms afford good protection.

CONCRETE for shaft lining is dumped from 1-yd bucket on steel form top and shoveled into 12-in. walls. Continuous pour of 110-ft deep shaft was made in 62 hr.

walls. This prevented the liner plate from slipping during the following excavations.

From the 16-ft depth on down, shaft sinking followed the method of alternate mucking and lining. As soon as a few feet of material were removed below a bottom ring of liner plates, excavation was stopped. Workmen then went into the hole, trimmed the sides, and set plates. Sometimes it was possible to bolt 4 or 5 plates together into part of a ring and set the group at one time. But often they had to be set individually. Plates were 38 in. long, 16 in. wide, and weighed 40 lb. They were bolted together through the flanges. Twenty plates made a 20-ft dia ring.

When every possible ring was

(Continued on page 106)

STAYS STABLE ...Hot or Cold!

Sinclair JET LUBRICANT won't thin out at high temperatures. It maintains lubrication at frigid temperatures. This superior product stays put on heavy exposed gears and circle tracks. It resists wash-out, throw-out and drip.

JET LUBRICANT saves money, too, because it lasts longer . . . reduces lubricant consumption . . . helps to lower power consumption. No heating is required to make it usable direct from its container.

There are *more* reasons why the right grade of JET LUBRICANT and other Sinclair products can improve your operations. Why not let a Sinclair Lubrication Engineer help solve *your* lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR JET LUBRICANT

Increase hardfacing production

Constant arc length regardless of operator movement or surface roughness.

HOW THE AMSCO MF WORKS

Bare mild steel electrode continuously feeds through the welding cone. It is magnetically coated with flux of your choice—manganese steel build-up or hardfacing alloy—at the point of the cone. Electrode feed is automatically regulated so that a constant arc length is maintained. Full coil lengths of electrode are consumed, with no loss of stub ends.

automatically...with the

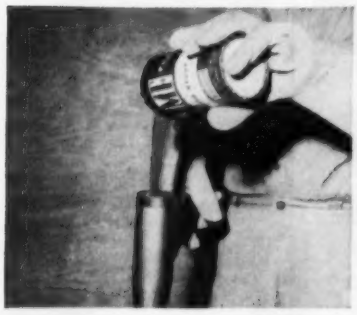
NEW AMSCO® MF WELDER

You steer the cone... the Amsco MF does the work. You lay down more metal in less time, because this welder uses a small diameter electrode and high current densities, which allow a high deposit rate without tiring the operator.

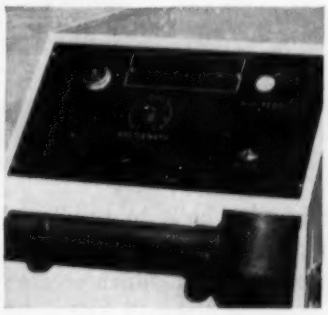
Electrode feed is continuous, and automatically regulated to maintain a constant arc length. This assures a more uniform bead by compensating for operator hand movement and irregular welding surfaces.

Welding is by open arc so you can see what you're doing. The Amsco MF is portable. It plugs into any standard welding unit. It requires no special setup.

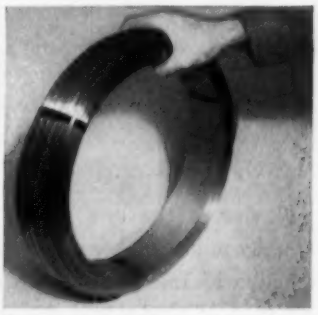
See a demonstration of the Amsco MF —its speed, quality of weld and uniform deposit. See how easy it is to operate. Try it and you'll think of many more reasons why it will save hardfacing time and labor costs. Your Amsco Distributor is ready to show it to you now.



Flux held in cone contains the welding alloy you require.



Easily identified, easy to operate panel controls.



Uses small diameter, coiled, bare mild steel electrode.

MAKE YOUR AMSCO DISTRIBUTOR HARDFACING HEADQUARTERS

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

KING SIZE PERFORMANCE

with NAYLOR *Lightweight Pipe*

It's no trick to get king-size performance from air and water lines in construction service when you use Naylor large diameter lightweight pipe.

Naylor is the one lightweight pipe built to handle jobs normally requiring heavier wall pipe. That's because of Naylor's exclusive lockseamed, spiralwelded structure which creates a pipe that is recognized for its greater strength and safety.

Its light weight makes Naylor pipe easier to handle and install, particularly with the one-piece Naylor Wedge-Lock Coupling to speed connections. Pipe sizes range from 4 to 30 inches in diameter.

For the complete story on this distinctive combination, write for Bulletins No. 507 and No. 513.

NAYLOR PIPE

NAYLOR PIPE COMPANY

1268 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

SLIP FORM LINES SHAFT . . .

Continued from page 102

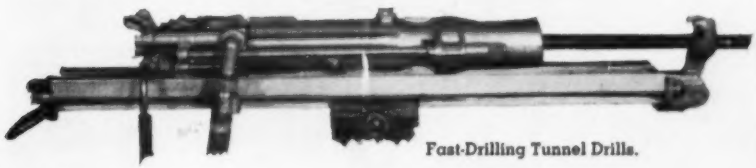
set, the men came out of the hole, and the clamshell resumed excavating. This method was continued to a depth of 100 ft, where excessive water was encountered. Vinnell quickly solved the problem by sinking two 50-hp deep-well pumps, a Peerless and a Pomona. As soon as the water level dropped, excavation was continued down to the 110-ft depth. The bottom was found to be satisfactory for bearing the weight of the pits, and a 3-ft floor of concrete was poured on top. The walls were then poured above by the slip-form, designed and built by Vinnell.

Quick-Patch

CONTRACTORS, often by necessity, are resourceful people. A good example shows Stuart Compton, tire maintenance superintendent of Morrison-Knudsen Company, Inc., at Mocuzari Dam in Mexico, making a tire repair on the wall of a truck tire without dismounting or deflating the tire.

Compton sank the heavy steel beam in concrete to serve as a base for a screw-type jack. The jack applies pressure to an electric tire-patching hotplate held against the damaged area of the tire. The resulting patch does not increase the strength of the damaged sidewall, but does seal out moisture and prevents gravel from doing additional damage.

Here's your profit line from Gardner-Denver



Fast-Drilling Tunnel Drills.

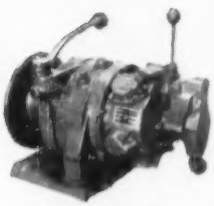
Hard-Hitting Asphalt and Concrete Breakers.

Easy-Digging Clay Spaders and Trench Diggers.

Powerful Sinkers for every type of rock.

Firm-Packing Backfill Tampers — single and triplex.

Positive Air Line Oilers.



High-Torque Air Hoists.

Trouble-Free Sump Pumps.

GARDNER-DENVER Since 1859

KELLER TOOLS

GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

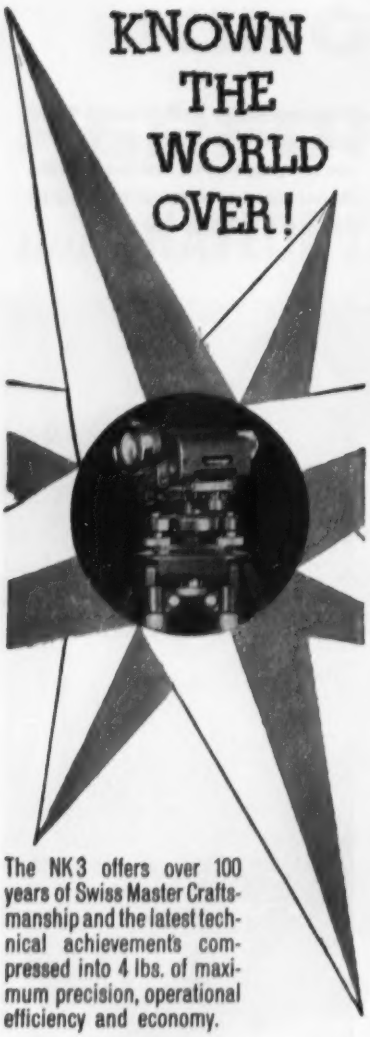
More construction work this year means more profit opportunities for you — if you're equipped with first-line Gardner-Denver construction equipment. Send for descriptive bulletins.

Portable Compressors from 60 to 600 c.f.m.

"Air Trac" and Wagon Drills with sectional rods for low-cost deep hole drilling. Note "Air Trac" towing its own portable compressor.

Tractor Jumbo — with Direct Connected compressor, rock drills and hydraulic boom jumbos.

KNOWN THE WORLD OVER!



The NK3 offers over 100 years of Swiss Master Craftsmanship and the latest technical achievements compressed into 4 lbs. of maximum precision, operational efficiency and economy.

- Mean leveling accuracy per mile (normal conditions ± .008 Ft.)
- Coincidence bubble is viewed directly through 30X telescope, allowing constant check on bubble centering while reading rod.
- Ready for use right out of the case. Highest precision leveling with coincidence spirit level and tilting screw. Coated optics give increased brilliance and contrast in the image.

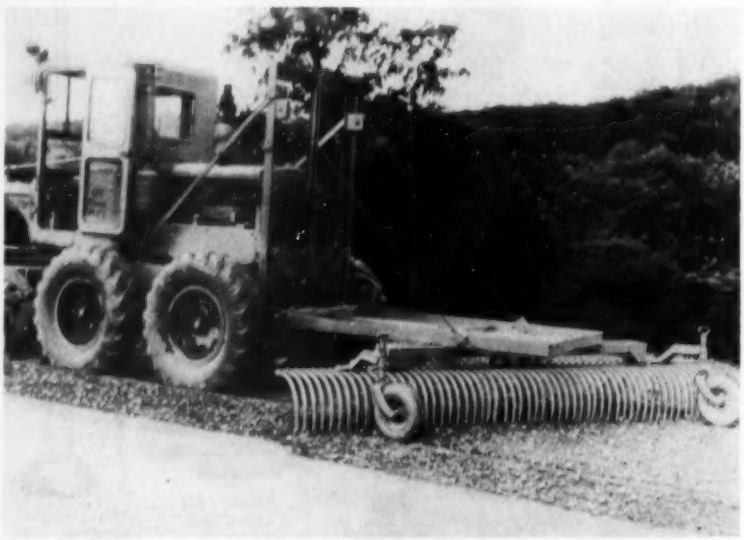
Ask for detailed Brochure **NK527-3**

SERVICE DEPARTMENT
FACTORY TRAINED PERSONNEL

Kern SWISS *The FINEST in SURVEYING EQUIPMENT*

KERN INSTRUMENTS INC.
120 Grand St., White Plains, N.Y.

YORK POWER-OPERATED GRADER RAKE folds from the center, and hydraulic lift raises it to vertical position for traveling or when grader is doing other jobs.



WORKING WIDTH of the rake is 12 ft. It's adjustable to four-angle positions, right or left, and caster wheels with vertical adjustments regulate depth of tooth penetration.

Motor Grader Rake Lifts Out of Way

DESIGNED TO SPEED UP CONSTRUCTION and maintenance on dirt and gravel roads, the hydraulically operated York Power Grader Rake can be attached to any motor grader.

The rake, adjustable to four-angle positions, follows the path of the grader blade and redistributes the windrow. It screens out larger stones and produces a blending action that results in a finer finish. Caster wheels at each end can be adjusted to regulate the depth of penetration of the teeth. Maximum working width is 12 ft.

Initial assembly to the motor grader requires 5 to 6 man-hr. This includes drilling holes in the grader frame for attaching rake to frame. The rake attachment becomes a permanent installation in most cases, as the rake unit can be lifted to a vertical position on the upright frame for traveling, or when the grader is doing other types of work. However, the unit can be removed in 1 hr if the situation requires.

It's manufactured by York Modern Corp., Unadilla, N. Y.

NOW... Handle Any Material You Can Load with Shovel, Dragline or Belt Loader!

C&D Movall

Spreading subbase "on the go" for airport paving—
a job no other wagon can do!

Movall's Rugged Rock Body takes the punishment of loading under big shovels (2½ to 6 yd.), handles 31-ton loads at high speeds.

The only wagon with

POSITIVE EJECTION

•

CONTROLLED DUMP or SPREAD

•

for hauling, dumping or spreading

- **Heavy Rock**
- **Shot Rock**
- **Dirt**
- **Mud**
- **Clay, Gumbo**
- **Ore**
- **Subbase**
- **Surfacing Material**
- **Sand, Aggregate**

Designed for use with

CATERPILLAR DW20 or DW21 TRACTORS

CAPACITY: 31 TONS, 25 CU. YDS. (HEAPED)

Greatest Work Range of Any Top-Loading Hauling Unit!

ROCK: Movall dumps its load well behind rear wheels in 12-14 seconds. Power ejection—*not gravity*—does the job.

MUD: Positive ejection scrapes out load of wet fill "on the go." Two Movalls on 1,000 ft. haul kept 3-yd. shovel busy on this highway job near Roseburg, Oregon.

DIRT with rock. Note how Movall maintains low center of gravity while dumping.

Study this chart. It shows why the scraper has for years been the most popular earthmoving tool. It shows, too, that the Movall with its "scraper-in-reverse" design, does the work of *both* a bottom-dump and an end-dump wagon. The Movall can handle *all* your top-loading work, regardless of material—and regardless of *where* and *how* you want to dump it.

WHAT WOULD BE A ***PERFECT*** HAULING UNIT?

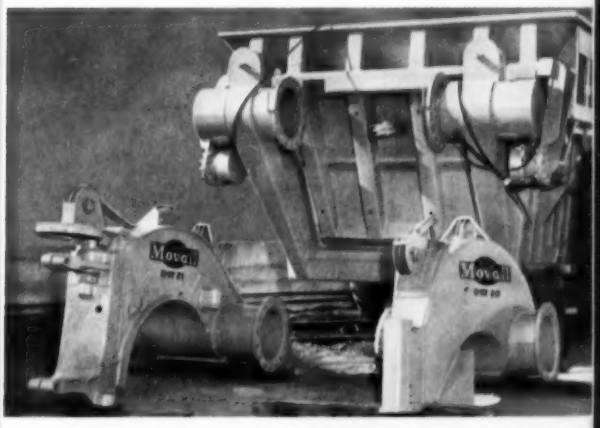
It would have these performance features:	**Here's how available units on the market stack up**				
	Scraper	**Bottom Dump**	**Tilting End Dump**	**Side Dump**	**Movall**
1. Pick up its own load	X				
2. Haul the load	X	X	X	X	X
3. Dump the load	X	X	X	X	X
4. Grade its own or previously dumped loads	X				
5. Discharge at controlled rate for feeding hoppers, etc.	X	*½			X
6. Spread "on the fly" in even lifts of any desired depth	X	*½			X
7. Dump load clear of its own wheels		*½	X	X	X
8. Eliminate tractor-dozer for spreading loose materials	X				X
9. Maintain low center of gravity while dumping	X	X			X
10. Handle heavy rock, big shovel loading			X	X	X
11. "Positive power ejection" to insure clean dumping of sticky or frozen loads	X				X
TOTAL SCORE	**9**	**4½**	**4**	**4**	**9**

*5. To a degree by restricting the opening. *6. Can windrow. *7. Depends upon material and job conditions.

Only Movall Brings You All These Profit-Building Advantages

Spreading pervious fill in 18" lifts, impervious in 6" lifts . . . Movalls handled both to specification by varying speed of tractor on Santa Isabella Dam job near Piru, California. Movalls made 5 trips per hour on 5,000 ft. one-way haul, taking 5 or 6 swings of 4-yd. shovel per load on pervious material.

Feeding Hoppers is easy with a Movall; cable-powered ejection gives operator perfect control of discharge rate.



Interchangeable Yoke speeds changeover from scrapers to Movalls, makes it easy to switch DW20 or DW21 prime movers.

Positive Ejection with a 140,000 lb. push boosts out rock loads fast, scrapes out mud, sticky clay or frozen ore. There's no stuck material to muck out, or rob you of a payload the next trip. Center of gravity stays low while dumping. You can dump over edge of fill in jackknifed or straight-on position, with all wheels locked if safety requires.

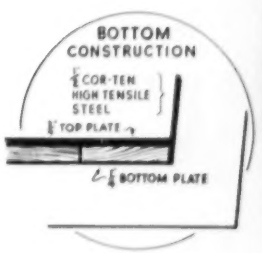
Controlled Dump or Spread . . . operator has complete control of discharge rate. Movalls can spread material in even lifts of any desired depth . . . feed hoppers at controlled rate . . . dump in a pile . . . or over the edge of a fill. With Movalls on the job, using a bulldozer or grader to spread fill, subbase or surfacing materials often can be eliminated.

Easy Interchange With Scrapers, or Prime Movers is provided by exclusive C & D interchangeable yoke. Two mechanics can switch Movalls and scrapers on either DW20 or DW21 tractors in 4 to 8 hours in the field—even less in the shop. Movalls use the same Caterpillar cable control as the scraper.

Extra Heavy-Duty Rock Body stands up under toughest service—loading big rock under 2½ to 6 yd. shovels—without damage. Box-beam yokes girdling the body on 16" centers prevent bowing. Alignment of the 1½"-thick ejector top rails is protected by heavily-reinforced box sections formed from the upper lip of the ⅝" side plates welded onto 6"x4"x⅜" full-length stiffener angles.

Bottom has 2" hardwood cushion sandwiched between ¾" top and ½" bottom plates. All body plates of COR-TEN high tensile steel for maximum strength with minimum weight.

Detachable Sideboards available on ejector for greater capacity when handling light materials.



See For Yourself How C&D Movall VERSATILITY PAYS OFF

CONDENSED SPECIFICATIONS

Capacity:		
Struck		19 cu. yds.
Heaped		25 cu. yds.
Maximum carrying capacity	(31 tons)	62,000 lbs.
Dimensions: (Movall only)		
Over-all width		11'0"
Loading height (Front)		10'4"
Loading height (Rear)		8'0"
Ground clearance		2'10"
Center of axle to rear of Movall		3'6"
Tailgate overhang beyond axle center, in dumping position		4'3"
Target area for loading		11'00" x 19'0"
Ejection (and dumping angle)		80°

Over-all Dimensions, with prime mover	DW20	DW21
Length	35'8"	39'5"
Center of driving axle to center of Movall axle	17'7"	21'9"
Width required for minimum turn (tractor at 90°)	30'	34'
Approximate shipping weight	56,460 lbs.	57,190 lbs.

Tire Requirement: (Movall)	24.00-29, 24 or 36 ply, rock lug
Tread (Movall)	9'0"
Brakes:	
Air Actuated (Synchronized with Tractor Brakes)	
Diameter and Width	20" x 8"
Wheels:	
Bearings	Tapered roller
Oil Seals	Spring loaded rawhide
Axle diameter	6"
Approximate Shipping Weight: (Movall only)	29,750 lbs

Wt. Distribution: (DW-20 or DW-21)	On Tractor	On Movall
Empty	67%	33%
Struck	47%	53%
Heaped	46%	54%

Approximate Dumping Time	12-14 seconds

Note: C & D Mfg. Co. reserves the right to make improvements in design and changes in specifications at any time without notice.

Only a Movall gives you the advantage of a rugged rock hauler plus positive ejection, controlled dump or spread to handle any material you can topload. It's your best buy in a haul unit because it does jobs no one-purpose hauler can handle. See for yourself — call your Caterpillar distributor or wire us today about a demonstration.

MOVALL'S low height (8' sides, 10'4" toward front) reduces swing time for shovel and dragline, means lower delivery angle and higher production from belt loaders.

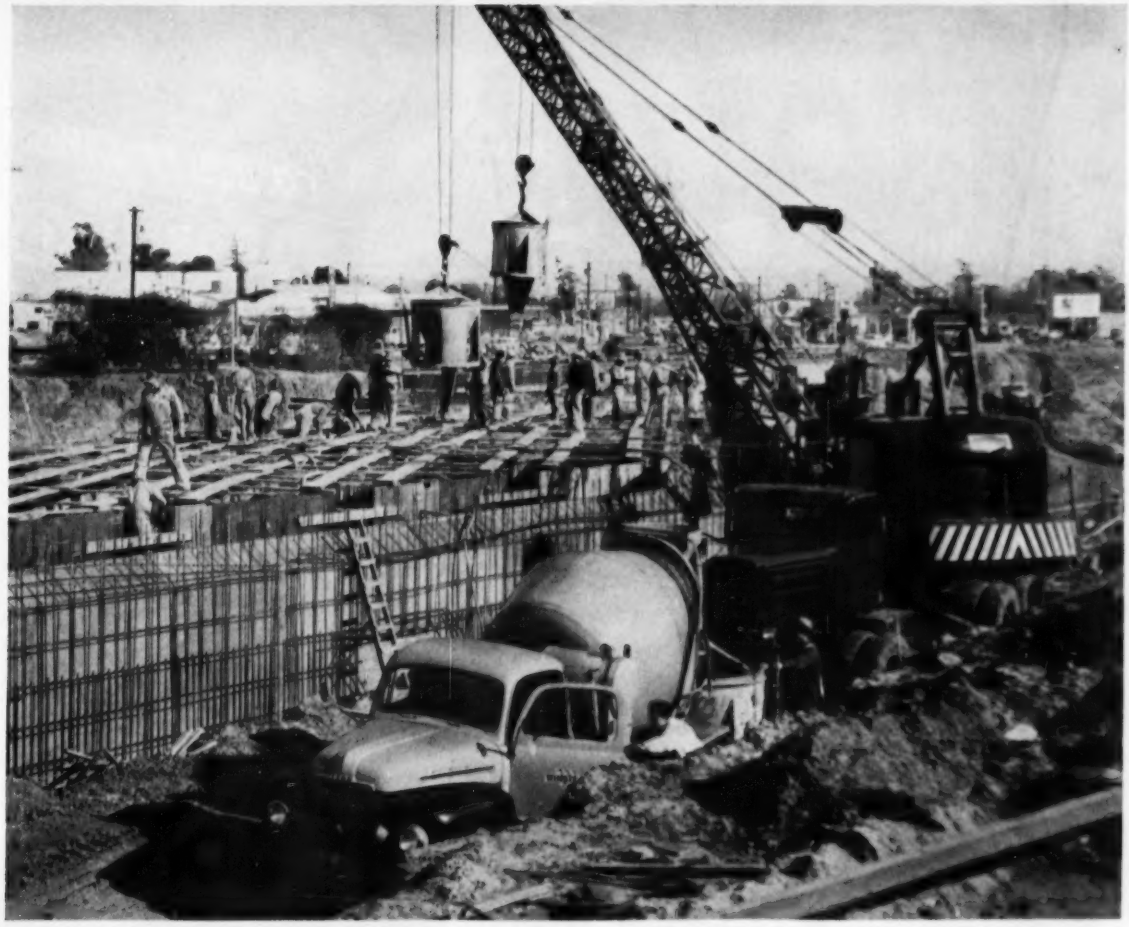
End dumping rock . . . proof of Movall's sturdy construction.

C & D MANUFACTURING COMPANY
Perkins (Suburb of Sacramento), California
Phone Hillcrest 5-8592

Maneuverability is excellent on either DW20 or DW21 tractors. Short turning width and ability to dump "on the go," or from either straight or jackknifed position makes it easy to plan a fast, efficient haul, dump and return cycle even on narrow cuts and fills.

Printed in U.S.A.

CONCRETE MIXING AND PLACING



CONCRETE BUCKETS handled by truck cranes make short work of highway underpass pour. The 2-yd standard buckets are fitted with rubber accordian hoppers to eliminate spillage and segregation. Note two buckets per crane, to save mixer waiting time.

12a. Handling and Placing Concrete

By A. F. GARLINGHOUSE
Gar-Bro Manufacturing Co.

CONCRETE SHOULD BE PLACED as near its final position in the forms as practicable. It should not be placed in large quantities at a given point, and then allowed to run or to be worked to any appreciable distance within the form. This practice causes segregation, because the mortar tends to flow ahead of the coarser material. It also results in sloping work planes between successive layers of concrete. In general, concrete should be placed in horizontal layers of uniform thickness, or placed against the face of the previously deposited concrete. Each layer should be thoroughly consolidated before placing the next layer.

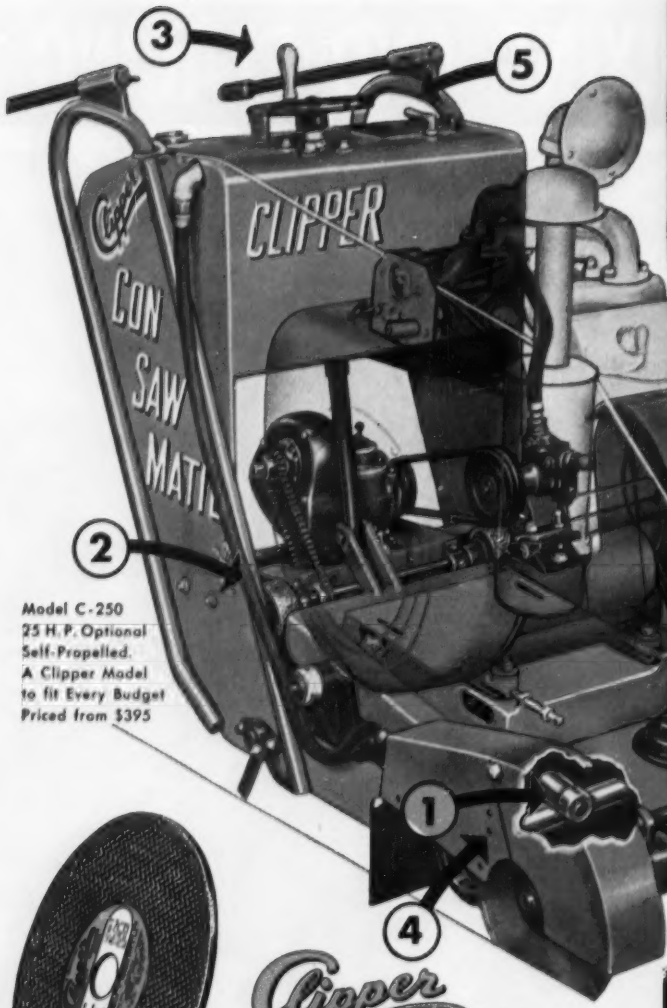
Concrete Buckets

Concrete buckets with vertical discharge gates provide for economical and efficient handling of concrete—either direct to place, or to receiving or collection hoppers. All buckets should have non-jamming, self-closing gates to permit discharging partial loads at the will of the operator. The most efficient buckets are cylindrical with ample center discharge gates.

Buckets are handled and transported by crane, derrick, cableway, truck, railway car, or any combination of these. Regardless of the method, care should be taken to prevent jarring and shaking, thereby avoiding a cause of segregation. This is particularly important if the concrete is of a plastic consistency.

Basically, there are three types of cylindrical buckets. The type to

(Continued on page 117)



Model C-250
25 H.P. Optional Self-Propelled.
A Clipper Model to fit Every Budget
Priced from $395

NOW-SEE WHY

You Cut More Concrete with Clipper®

"CAN'S RIGHT THRU"

CONCRETE SAWS

--LOOK INSIDE

Behind Engine . . .
Under Frame . . .
for Famous . . .
CLIPPER QUALITY
plus **5** *of the*
EXCLUSIVE FEATURES

THAT GIVE YOU LOWEST CUTTING COST PER FOOT!

Clipper® BLADES For Best Results

- **CLIPPER "GREENCON"**
  Savings you never dreamed of—up to 80%! The original Reinforced Abrasive Blade that knifes through green concrete with aggregate of limestone, coral, or steel mill slag. "Try them on your next job."
- **CLIPPER DIAMOND**
  A Blade for any job—any aggregate—every saw! Choose your Clipper Diamond Blades from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

By the Makers of Clipper Masonry Saws

ASK FOR **FREE** DEMONSTRATION ON YOUR JOB

LOOK AT THESE 5 FEATURES

1. 4 Wheels with 3-Point No-Bind Blade Suspension
2. Self-Propelled with Abrasive-Coated Drive Wheels
3. Positive Screw Feed
4. Patented Water Application
5. Dashboard Controls

Send Coupon for the Whole Story

Clipper® KANSAS CITY, MO.

Better Mail the Coupon NOW!

Genuine Clipper Products Are Sold Only Direct. Immediate Shipment from Factory Branches in Principal Cities, Coast to Coast. Mail Coupon for Same-Day Service.

CLIPPER MANUFACTURING CO.
2809 N. Warwick • Kansas City 8, Mo.

- ☐ I want a FREE DEMONSTRATION of a Clipper Concrete Saw.
- ☐ Send FREE Literature on Clipper Concrete Saws.
- ☐ Send full information on Clipper Concrete Blades.
- ☐ Have a Clipper representative call on me

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Name_____

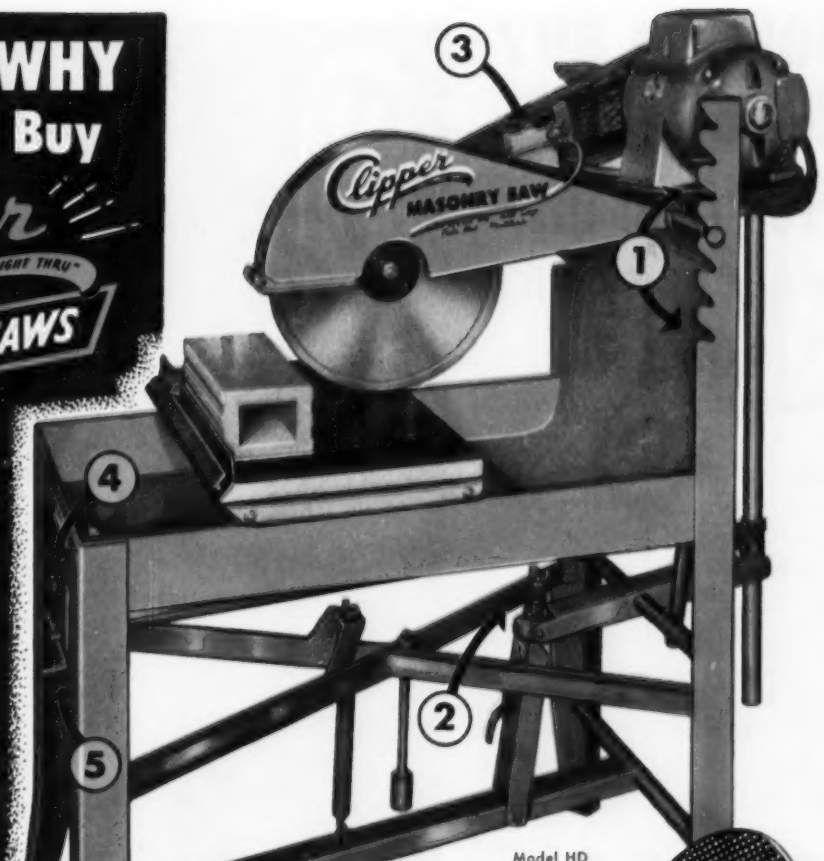
Address_____

City_____ State_____

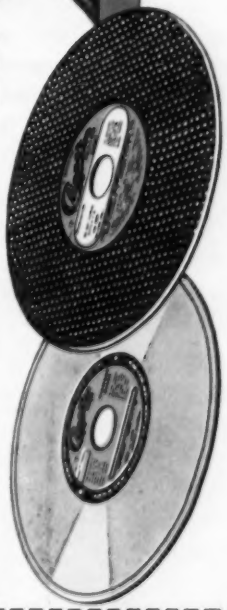
NOW-SEE WHY 4 Out of 5 Buy Clipper MASONRY SAWS

FOR Best Performance Demand the Saw with All These Features:

1. Select-A-Notch—Easy one-man height adjustment for cutting any size masonry material. Patented.
2. Pressure Equalizer Spring—Cushions blade pressure and makes your blades last longer. Patented.
3. Wet-or-Dry Pump—With Patented Water Application supplies water to the cutting edge, where it should be.
4. Adjust-A-Cut—Frees the Cutting Head for finger-tip control at any desired height.
5. Head-Lock—Turn the handle to hold Cutting Head — for fixed Diamond Blade cutting.



Model HD
Wet or Dry Cutting.
A Model to fit every budget, priced from $265



Clipper BLADES CUT ALL MATERIALS!

"Polk-A-Dot"—A CLIPPER FIRST!
New Triple-Reinforced "CBR" Abrasive Blades —in specifications for EVERY material, Hard to Soft. Thousands of extra abrasive "Dots" reduce side friction, deliver maximum power to cutting edge. Rugged — Dependable — Safer.

CLIPPER DIAMOND
Outstanding Performance in smooth efficiency is a part of every Clipper Diamond Blade—available in specifications for cutting every masonry material. **If You Don't Know Diamonds, Know Your Manufacturer!**

By the Makers of Clipper Concrete Saws

ORDER YOUR CLIPPER MASONRY SAW ON **FREE TRIAL**
Send Coupon for the Whole Story

Clipper KANSAS CITY, MO.

Genuine Clipper Products Are Sold Only Direct. Immediate Shipment from Factory Branches in Principal Cities, Coast to Coast. Mail Coupon for Same-Day Service.

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- ☐ Have a Clipper representative call on me.

203X

Name_____

Address_____

City_____ State_____

HOW TO BUY RUBBER HOSE

FOR LONG LIFE IN ROUGH SERVICE

. . . and get "More Use per Dollar"

Look for a hose construction that is easy to handle, yet strong enough to stand up under tough operating conditions.

It is not necessary for hose to be thick and stiff and heavy. It can be light in weight and still withstand hard use on the job. The lighter the weight, the easier the hose is to handle . . . the better men will like to work with it with less fatigue. Be sure, too, that the hose you buy is the most flexible for the type or diameter you need. If it coils and uncoils easily it is not only easier to handle, there is less internal stress . . . and no kinking, breaking or separation of cover, tube or plies.

If the hose does not kink, it will last longer and you'll get full flow at all times . . . even though it is dragged over rough terrain.

Specify by name the hose construction that combines light weight, flexibility and non-kinking characteristics with maximum safety . . . specify Raybestos-Manhattan Homoflex Hose.

HOMOFLEX HOSE

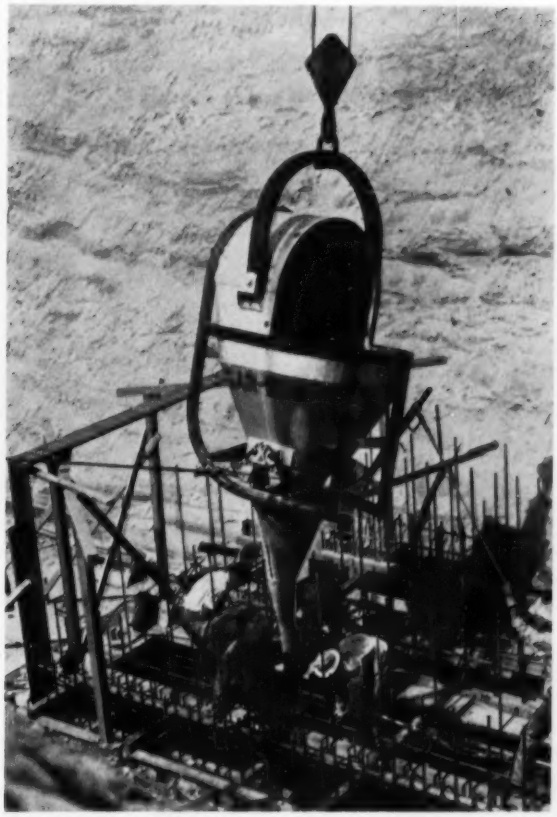
This is an exclusive R/M construction made in types for handling air, water, gases and other general uses. It has a homogeneous, inseparable tube-to-cover bond. It's as flexible as a rope, light and easy to handle, yet strong enough for the toughest jobs. It maintains uniform inside and outside diameters for easy coupling. . . . Homoflex Hose reduces hose costs by increasing hose life . . . and it's only one of many types an R/M representative can help you select for both general and special purposes. Let him show you why R/M Hose lasts much longer . . . gives you "More Use per Dollar".

RM-807

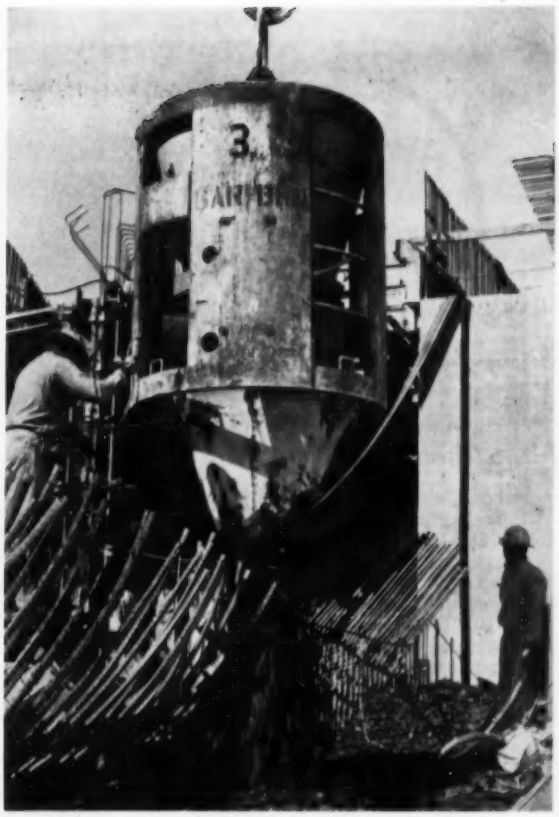
MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings
Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Bowling Balls



LAYDOWN BUCKET, whose spring-closing discharge gate is controlled by pull rope, dumps concrete into footing. When resting in horizontal position, 2-yd bucket is easily charged by truck mixer.



PNEUMATIC GATE, controlled by pull chain and operated by high-pressure air from tank on bucket, makes it easy for 2-yd heavy-duty bucket to discharge as desired. Rubber funnel confines pour.

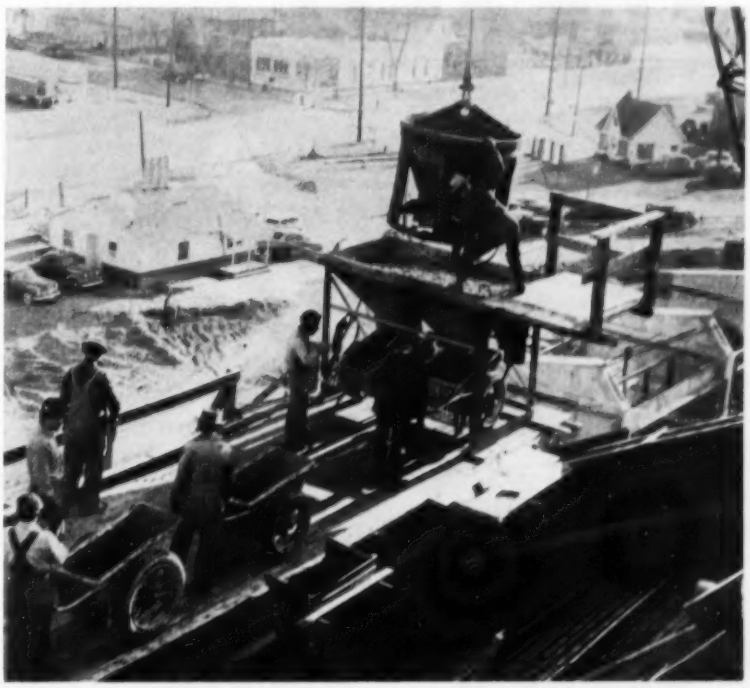
be used is dependent upon the size of aggregate and consistency of concrete to be poured, as well as the capacity of the equipment that handles the bucket.

• **Lightweight buckets** are built with smaller gates for use on light cranes to handle normal-slump or wet concrete with –3 in. maximum size aggregate. Sizes range from 1/3 to 1½ cu yd.

• **Standard-duty buckets,** with larger gates, are built for the stiffer or lower slump concrete with 3 in. maximum size aggregate. Sizes range from ¾ to 4 cu yd.

• **Heavy-duty buckets,** with extra-large, specially designed discharge gates, are built for handling dry or extremely low-slump concrete with aggregate up to 6-in. dia for mass concrete construction. Heavy-duty buckets are available with either single or dual compartments and with either manual or air-controlled discharge gates. Sizes range from 2 to 12 cu yd.

(Continued on next page)



RECEIVING HOPPER holds concrete for transfer to carts, which will take it to forms. The 2-yd double-gated floor hopper is supplied by a crane-handled 1-yd lightweight bucket.

'round the clock!

. . . without watching!

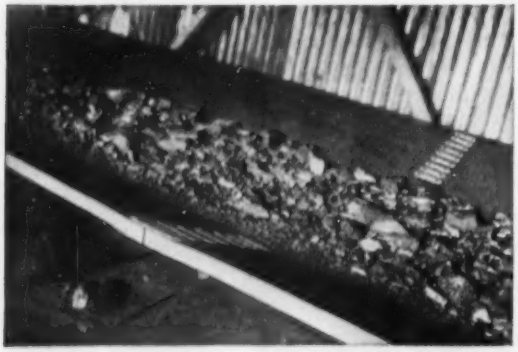
24 hours a day, seven days a week, this electrically controlled Marlow Self-Priming Centrifugal Pump automatically pumps seepage water up and over a 75-foot wall at this busy quarry. When you need dependable pumping for rugged service, see your Marlow dealer for the complete Marlow line of AGC rated pumps or write for Bulletin C-04.

MARLOW PUMPS
Ridgewood, New Jersey
Divison of Bell & Gossett Company

9-127

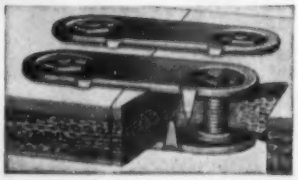
FLEXCO®

BELT FASTENERS and RIP PLATES



FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

★ FLEXCO Fasteners make tight butt joints of great strength and durability.
★ Trough naturally, operate smoothly through take-up pulleys.
★ Distribute pull or tension uniformly.
★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO., 4699 Lexington St., Chicago 44, Ill.

DRY CONCRETE for dam is discharged through gate controlled by low-pressure air supplied by hose hooked on temporarily at point of pour. Gate closes automatically.

• **Laydown or rollover buckets** with low charging heights are built in both lightweight types for normal-slump concrete, and heavy-duty types for low-slump concrete, with center discharge gates. Sizes range from ¾ to 5 cu yd.

• **Bucket attachments.** When placing concrete direct to forms or hoppers, either a rubber collection hopper attached to the bucket or a suspended steel sub-hopper with elephant trunk should be used. They confine the vertical flow of concrete from the large bucket gate opening to the forms, thereby eliminating waste and preventing segregation.

Receiving Hoppers

To insure an uninterrupted supply of concrete from the mixer to the handling and transporting equipment, concrete hoppers are recommended. Hoppers should be provided with vertical drop at the discharge gate. When discharge is at an angle, the larger aggregate is thrown to the far side of the container being charged, and the mortar is thrown to the near side. This results in segregation that cannot be corrected upon further handling of the concrete. Center discharge hoppers are preferable. Low-height portable hoppers on pneumatic-tired wheels or skids for truck - mixer discharging save

"That's Union Oil T5X going into the crankcase of this new Chev pickup"

"We use Union's T5X motor oil exclusively in about 75 pieces of gasoline-powered equipment here on our Ramona Freeway job... 3.96 miles of 8-lane highway with 19 bridges and clover leafs, the largest single contract of this kind ever let in the state of California.

"Our oil and filter change interval is 2,000 miles for vehicles and 200 hours for stationary engines. Yet every time we drain a crankcase, we can't help noticing that the color and body of T5X looks as good as when we put it in. I can't quote any figures on how much T5X is extending our engine overhaul interval because in the past two years that we've been using T5X these engines have needed no appreciable amount of work for any reason whatsoever."

Like Mr. Brown of Peter Kiewit Sons' Co., maintenance men and master mechanics who've once tried T5X seldom permit any other oil to be used in the equipment which they service and maintain.

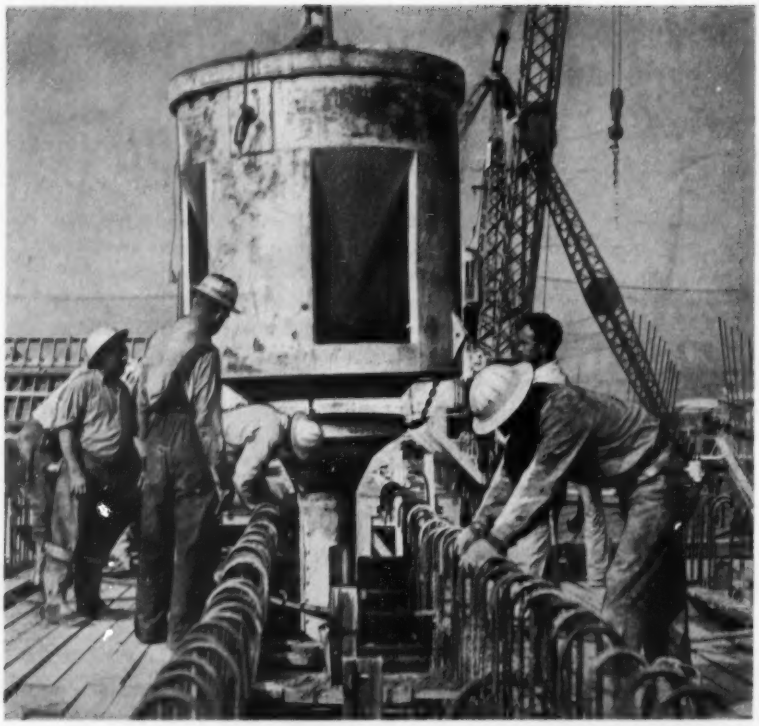
If you're not yet familiar with *amazing* purple T5X, we suggest you call your nearby Union Oil representative and place a sample order today.

J. D. Brown, master mechanic, Peter Kiewit Sons' Co.

B. A. Anderson, heavy duty mechanic, Peter Kiewit Sons' Co.

76 UNION OIL COMPANY
OF CALIFORNIA

Los Angeles: Union Oil Bldg. • **New York:** 45 Rockefeller Plaza • **Chicago:** 1612 Bankers Bldg. • **New Orleans:** 644 National Bank of Commerce Bldg. • **Atlanta:** 401 Atlanta National Bldg. • **Kansas City, Mo.:** 612 W. 47th St.



STEEL SUB-HOPPER and 20-in. dia rubber elephant trunk are suspended below 4-yd standard-duty bucket to make high wall pour on dam. Elephant trunk prevents segregation.

truck-mixer time, thereby increasing rate of concrete delivery at lower cost.

Depositing Concrete

Regardless of the method of transporting concrete—whether by concrete buckets, concrete carts, pump, or chute—vertical placement within the forms is important.

• **In high walls,** concrete should be placed to a point about 1 ft below the top, and 1 hr or so allowed for settling. Concreting should then be resumed before set occurs, to avoid a cold joint. A stiffer consistency can be placed in the upper section, because the concrete is accessible for puddling. The form should be overfilled, and excess concrete then cut off by screeding after it has partially stiffened. To prevent segregation, concrete should not be allowed to drop freely more than 5 to 6 ft.

• **In narrow walls** with closely spaced reinforcing steel, collection hoppers with rectangular discharge

(Continued on page 124)

MAINTENANCE of a
VIBRO-PLUS ROLLGEAR
is child's play...

The Patented Internal Vibrator That Keeps Upkeep Costs Down...

There's no involved, intricate process in keeping the Vibro-Plus Vibrator in working order! Advance design eliminates those parts which cause the most trouble and breakdowns: clutches, V-belts, high-speed flexible shafts and makes it completely interchangeable between gas, electric and air.

It requires no maintenance or lubrication on the job. It is factory lubricated and needs relubrication only after the job is done.

A really fool proof unit which is covered by a 6 month guarantee.

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VIBRO-PLUS PRODUCTS, INC.
54-11 Queens Blvd., Woodside, New York

19 mph tractor handles all cleanup on 4½-mile section of Ohio Turnpike

To grade a 4½-mile section of the Ohio Turnpike south of Sandusky, D. R. Smalley & Sons of Celina had to move 1,300,000 cubic yards of black dirt, silted sand, and clay.

While most of the production dirtmoving was assigned to a conveyor-type loader working with a fleet of bottom-dumps, contractor's mobile Tournatractor proved invaluable for fast handling of scattered dozing and miscellaneous tractor jobs.

Cleans spillage around loader

Most important project for the Tournatractor was cleaning overflow and spillage in the cut. By moving quickly around loader, pulling-and-pushing tractors, and haul units, it did this work without interruption to the loading cycle. In spare time, Tournatractor made good use of 19 mph travel speeds by driving all over the project to handle a wide variety of "hit-and-run" dozing and towing assignments.

Whenever one of the bottom-dumps got stuck in soft footing or climbing upgrade, Tournatractor came to the rescue... pushed hauler up the slope or through muddy spots... then hurried back to its regular job at the loader. On other occasions, unit spread fill... graded slopes and did other dozing... and towed a LeTourneau-Westinghouse sheepsfoot roller.

Does work of several crawlers

To handle the same scattered assignments completed by this one Tournatractor, company officials say several crawlers would have been needed.

"Tournatractor can really get around," is the way Supt. George M. Smalley describes Tournatractor mobility.

Operator H. K. Castal agrees, "I like the maneuverability of the Tournatractor. It's easy to operate, too!"

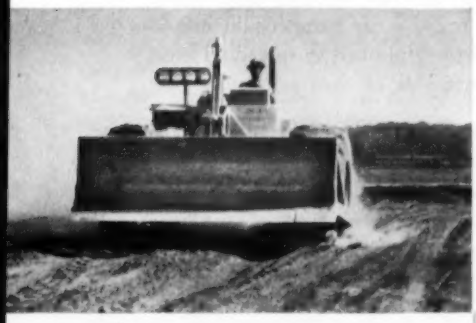
Consider these 3 advantages!

No matter what size equipment fleet you have, no matter whether you move dirt with scrapers or trucks — or both — you'll want to investigate these major Tournatractor advantages!

1. Tournatractor's fast forward speed, instant gear changes and 8 mph reverse enable it to do twice as much work as a crawler-tractor on most jobs.
2. Tournatractor reduces travel time between jobs by driving anywhere under its own power at speeds up to 19 mph.
3. Its four single-wheel units, with power traveling on sealed anti-frictions, require much less maintenance than crawlers with their 450 to 550 moving parts.

Why not see and judge for yourself? Let us demonstrate Tournatractor's abilities on your job. Call or write us to arrange time and place.

Tournatractor—Trademark T-717-H-b



Driving job-to-job at speeds to 19 mph, Tournatractor's low-pressure tires absorb most of the jolts of cross-country travel. Says Operator H. K. Castal, "Tournatractor rides nicer than a crawler. You don't get the old jar!"

Tournatractor helps bottom-dump up grade. Tractor's 208 hp diesel, big 21.00 x 25 low-pressure tires, and 4-wheel drive combine to provide plenty of pushing power.

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

47% advantage for rubber over tracks

Widening road to Ohio Turnpike,
7-yd. Tournapull averages 60 yds. per hour. Slower 11-yd. crawler-scrapers average only 41-yds. in spite of 400 ft. shorter cycles.

	122 hp, 7-yd. D Tournapull	93 hp crawler, 11-yd. scraper	148 hp crawler, 11-yd. scraper
Load time self-loading sandy clay (all units in same pit)	1.2 Min.	Not timed	Not timed
Total cycle time	4.5 Min.	12.7 Min.	10.3 Min.
Haul distance one-way	1100′	1100′	1100′
Return distance	1500′	1100′	1100′
Return speed on 1000′ of paved road in traffic	14 MPH	Could not haul on pavement	
Top speed possible	28 MPH	6 MPH	5 MPH
Trips per 55-minute hour	12	4½	5⅓
Yards per 55-minute hour	60	38	44

The above figures are averages of a day-long time study made by field engineers on Kane, Ohoro & Haenny, Inc. 8-mile road widening job between Youngstown and the Ohio Turnpike. The 47% advantage computed for the Tournapull was called "conservative" by the contractors. Based on their experiences on Turnpike subcontracts, they estimate the one "D" will move as much dirt, over-all on this job, as two crawler-drawn scrapers combined. And here's another advantage...

D Tournapull hauls on blacktop where crawlers can't travel

Most of the time, rubber-tired "D" traveled down the 3-lane blacktop highway, spread its sandy-clay loads along either shoulder. Its high speed on rubber, plus fast-acting 4-wheel air brakes and power steer, allowed the rig to travel safely and fast through open traffic. The crawler-scrapers, on the other hand, could not haul on the pavement, and therefore had to spread all their loads on shoulder on same side of road as borrow pit.

Comparing the two dirtmovers, Company Partner Albert Haenny says, "On 90% of your work you're better off with the D Tournapull. Even on short hauls, the smaller 'D's' will move almost as much dirt as bigger units when you average it out."

Superintendent Paul Ellis agrees. "I like many things about D Tournapulls," he says. "They can travel across the road without planking and work both sides. They're fast and can get around where other rigs can't. They're worth their weight in gold on road jobs like this one."

For low-cost dirtmoving, investigate Tournapull maneuverability and 28 mph speed for yourself. Write or call us for a demonstration on your job. See for yourself what the "D" can do...either self or pusher-loaded...alone on scattered odd jobs or in fleets on big-yardage assignments.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-709-H-b

Now available — FREE — a valuable new reference book — "Earthmoving, An Art and a Science". Contains 60 pages of detailed information on how to increase output and lower dirtmoving costs. Unbiased. Written by experienced field engineers . . . checked by veteran dirtmovers. For your free copy, call your Distributor or write to LeTourneau-Westinghouse Company, Peoria, Illinois.

Send to: LeTOURNEAU-WESTINGHOUSE COMPANY, Peoria, Illinois

Your Name .....

Title .....

Company .....

Address .....

(Street, City, State) DP-709-H-b

Webber-McCann moves 600 yds. hourly with 4 C Tournapulls

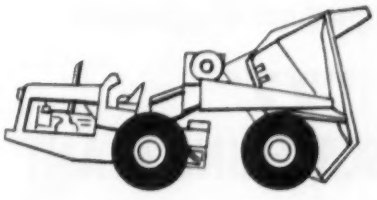
Webber & McCann, Inc., 110 Ashton Ave., Millbrae, California, had 120,000 yds. of rocky decomposed granite to level for the Westview housing project on Skyline Boulevard south of San Francisco. They started the job with four electric-control 14-yd. C Tournapulls and two 148 hp crawler-20-yd. scraper combinations.

Despite heavy rain and frequent work-slowing fog, Mr. McCann reports each of the 4 Tournapulls averaged 150 pay yards per hour. On typical hilly 1825 ft. cycles, "C's" averaged round trip every 4¾ minutes . . . delivered 12 to 13 loads per hour. This output, day in and day out, enabled the Tournapulls to handle 85% of the dirt. Each Tournapull outproduced each crawler, 3-to-1 . . . yet each Tournapull cost the contractors 20% less than each crawler-scraper combination. And here's another advantage . . .

Drives 35 mph through traffic

Tournapulls not only moved dirt at a much lower cost per yard than the crawlers, but saved money coming to the job, too. While crawlers had to be loaded and brought in by truck and trailer, Tournapulls drove under their own power through city traffic to the work site. Top speed in traffic was 35 mph. This saving will be repeated when this job is completed and equipment is moved to the next site.

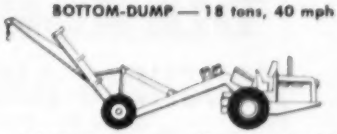
Webber & McCann's Tournapulls have performed like this 12 months a year, for over 3 years now. Let us show you how Tournapulls can make the same record for you. Perhaps they can do even better! Present-model "C's" have several important advantages over Webber & McCann's veteran machines. Horsepower has been boosted from 186 to 208. Capacity is up from 14 to 16 yds. heaped. Top speed is now 40 mph instead of 35. And the addition of Westinghouse Air Brake quality manufacturing traditions to LeTourneau dirtmoving know-how guarantees you top mechanical efficiency and service. Ask for a demonstration on your job to prove it!



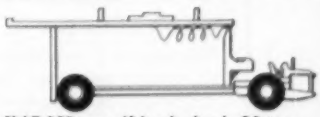
Insure your future

For less than 25% of the cost of the original unit, you can get an 18-ton Rear-Dump hauler to interchange with the Tournapull Scraper. You save money because all you need buy is the Rear-Dump Body . . . you can interchange not only the prime-mover but also rear wheels, tires, and brakes. Other hauled units, shown right, put you in better position to profitably handle all kinds of future work, further reduce equipment investment.

BOTTOM-DUMP — 18 tons, 40 mph



OFF-ROAD CRANE — lifts and carries 20 tons



FLAT-BED — self-loads, hauls 20 tons

LOGGING ARCH — 67,000 lb. line-pull, 30 mp

Tournapull—Trademark Reg. U. S. Pat. Off. P-689-8-b

A Subsidiary of Westinghouse Air Brake Company

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

your Distributor or write to LeTourneau-Westinghouse Company, Peoria, Illinois.

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GOODMAN MANUFACTURING COMPANY
Halsted Street and 48th Place • Chicago 9, Illinois

CONCRETE . . .

Continued from page 120

openings should be used. To these are attached various single lengths of rubber elephant - trunk - type drop chutes.

• **In wider walls,** collection hoppers with a round discharge opening can be coupled with flexible-type steel drop chutes. These drop-chutes can be shortenend by unhooking and removing sections, as the pour progresses.

• **In open areas** where space permits, good results can be obtained by direct vertical dumping from concrete buckets with the proper attachments.

• **In slab construction,** placing of concrete should be started at the far end of the work so each batch will be dumped against previously placed concrete, not away from it. The concrete should not be dumped in separate piles and the piles then leveled and worked together.

Collection Hoppers And Drop Chutes

To place concrete properly without segregation, collection hoppers in combination with rubber elephant trunks or sectioned flexible steel drop chutes, should be used.

Diameters of the proper rubber elephant trunk or steel drop chute depend on the character of the concrete being placed.

• **Collection hoppers** are available in three basic designs:

1. Hoppers with one side open to receive concrete from push carts, or power carts.
2. Hoppers with four sides for charging with normal-slump concrete by concrete bucket.
3. Hoppers with extra-steep slopes and rectangular top and large oval discharge opening, in combination with an oval-to-round transition drop-chute section, to handle extremely low-slump concrete.

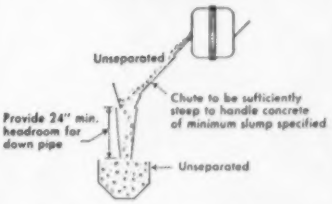
• **Drop chutes** for the above hoppers are of two types:

1. Flexible rubber elephant trunks with rectangular connection collars or round collars, for narrow walls.
2. Flexible steel drop chutes for

(Continued on page 126)

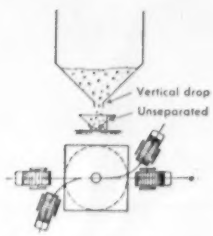
Correct and Incorrect Method

CORRECT

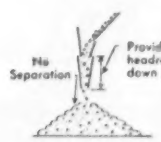

Unseparated
Chute to be sufficiently steep to handle concrete of minimum slump specified
Provide 24" min. headroom for down pipe
Unseparated

Above arrangement prevents separation regardless of length of chute.

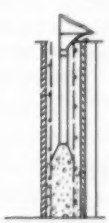
Concrete should be dropped vertically directly over gate opening.



Center discharge from hopper with vertical drop into center of buggy. Approach from opposite sides permits rapid loading.



Above arrangement prevents separation no matter how short the chute whether conveyors being discharged into hoppers, cars, trucks or forms.

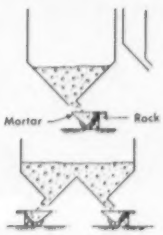


Drop concrete vertically into rubber elephant trunk to control flow and prevent segregation.

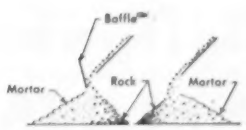
INCORRECT

Filling of buckets, cars or hoppers directly from the mixer discharge may cause separation.

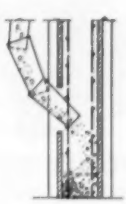
Dropping concrete on sloping sides of hopper should be avoided.



Sloping hopper gates which are in effect chutes without end control cause objectionable separation in filling the buggies.



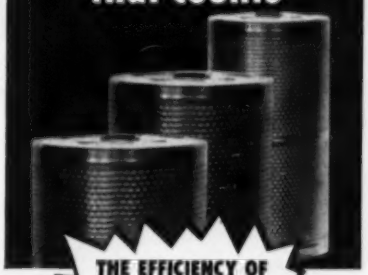
Improper or lack of control at end of any concrete chute, no matter how short, results in separation. Usually a baffle merely changes direction of separation.



Permitting rapidly flowing concrete to enter forms on an angle invariably results in separation.

HANDLING CONCRETE in such a manner as to insure best possible end product is not as simple as it would seem to be. Above recommendations come from U. S. Bureau of Reclamation. For other USBR recommendations see CM&E, Nov. '54, p 64.

it's what's **inside** that counts



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DON'T BE MISLED BY PRICE ALONE!

There is no substitute for DIESELPAK'S Patented Filtering Process for H.D. Compounded oils AT ANY PRICE. The DIESELPAK cleans more oil faster—keeps it CLEAN longer—and gives more service and better engineered protection than any other filtering element. It PAYS to get the BEST!

√ Protects engine

The DIESELPAK is designed to remove not only ABRASIVES but also CONTAMINANTS such as moisture, carbon, acid, etc., from oil, and is engineered to keep the **filtering media** and the **removed contaminants** from migrating back into engine.

√ Extends periods between drains

The DIESELPAK collects and holds even the most finely dispersed contaminants without affecting or removing compound additives from the oil. A glance at the dip stick will show that the oil is CLEANER—symbol of better lubrication and longer oil life enjoyed only by Luber-finer users.

√ Takes less oil

The DIESELPAK because of its engineered construction requires 2 to 4 quarts less oil than spongy substitute filter elements being offered for use in the Luber-finer housing. This is an additional saving enjoyed when using the DIESELPAK.

LUBER-FINER PACKS AVAILABLE:

1. *REFINING PACK*—Introduced to the public in 1935 for use with straight mineral oils, fuel oils, hydraulic oils, and inhibited industrial oils.

2. *DIESELPAK*—First made available in 1941, the DIESELPAK was primarily designed for use with H. D. detergent compounded oils and has also achieved outstanding results when used with fuel oils and straight mineral oils.

Write for complete information to Dept. 79

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THE NEW UNIT Challenger
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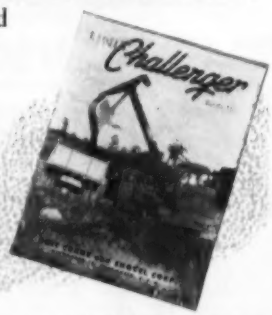
NOTHING BUT THE BEST! There's no substitute in the ⅜-yard excavator field for EXPERIENCE. UNIT has it! UNIT knows what you need in a ⅜-yard machine . . . knows how to engineer the power, over-all performance-superiority and economy of operation for the jobs you want to do **profitably** with a ⅜-yard dragline, clamshell, crane or trenchoe. The New UNIT CHALLENGER proves this with such features as: **Self-aligning Hook Shoes . . . Force Feed Lubrication . . . Full Floating Trunnion-Mounted Tapered Drums . . . Torque Converter, etc.**

See the many other new features illustrated and described in UNIT CHALLENGER Bulletin C-800. Write for your copy of this bulletin.



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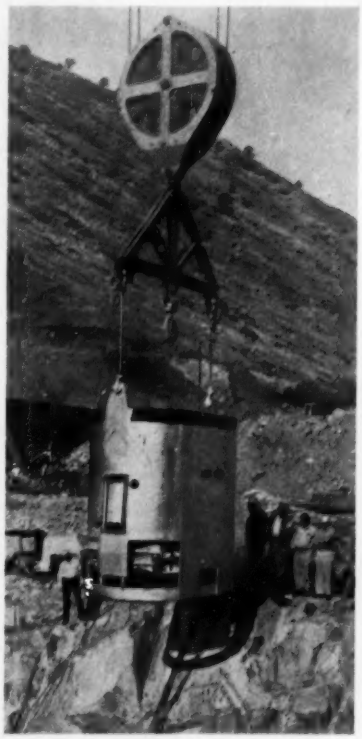


DUAL-COMPARTMENT BUCKET handles 8 yd of concrete, yet meets Corps of Engineers' specifications that limit each batch to 4 yd.

wide walls or open areas. The chutes are usually round, and in sections from 2 to 3 ft, with hooks and chains for connecting together.

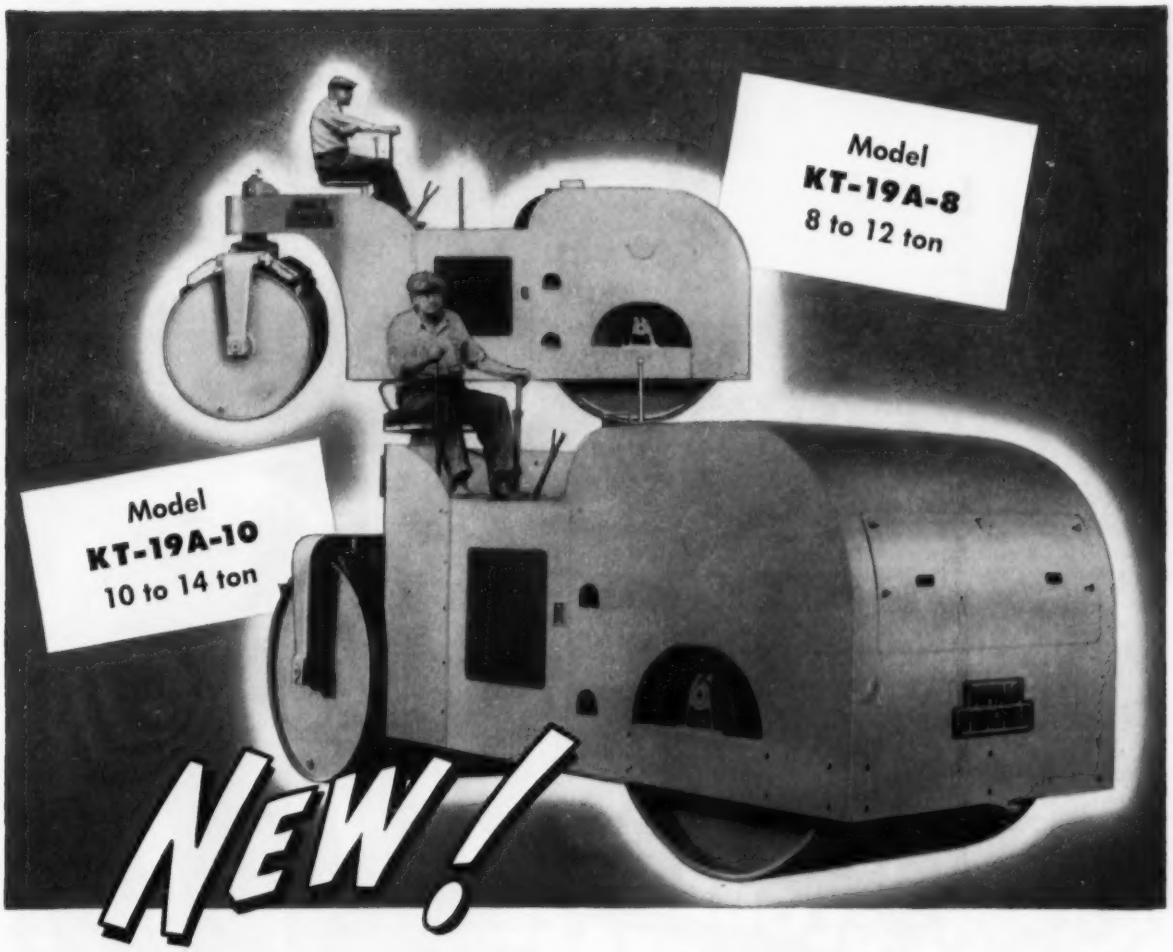
Straight Line Chutes

Steel straight-line concrete chutes should be round bottomed and of ample size to guard against overflow. A slope not flatter than 1 to 3 and not steeper than 1 to 2 is recommended. Long chute lines are not recommended on important work. All chutes should be equipped with a receiving hopper at the upper or charging end, and a discharge deflector at the discharge end. Thus the concrete is vertically dropped to help prevent segregation.

Check Lists

A concrete structure that is adequately designed must be properly constructed to carry the designed loads, and built within an economical time and price range. Up-to-date concrete handling and placing equipment, designed to handle the required specification concrete, is available. But each job

(Continued on page 129)



BUFFALO-Springfield announces line of STANDARD TANDEM ROLLERS

These new STANDARD Tandem Rollers are designed especially for low-cost handling of any compaction job where pressures of from 8 to 14 tons are required.

Included as standard equipment is a heavy-duty, single-stage torque converter* that automatically matches power and speed to the material and grade variations of the job.

Without gear shifting, drivers can operate these rollers at any selected speed from 1 to 5 mph with the engine running continuously at its most efficient and economical power peak (2-speed mechanical transmission also available as optional equipment).

The heavy-duty, industrial-type engine (diesel or gasoline optional) delivers dependable power under all kinds of operating conditions. Buffalo-Springfield's widely-known bevel gear and final drive assembly offers the advantages of unusually low gear tooth bearing pressures, results in less wear, and is easy to adjust when required.

The massive, all-welded frame is heavily reinforced to maintain rigidity over a long operating life. Control instruments and levers are conveniently located to simplify the operator's job.

Ask your nearest Buffalo-Springfield distributor to tell you all about the new STANDARD Tandems. Dollar-for-dollar, feature-for-feature, they can't be matched by any other rolling equipment available today. Write for the new illustrated Bulletin No. S-68-555.

**Buffalo-Springfield has offered torque converter power since 1951.*

BUFFALO ROLLER COMPANY — SPRINGFIELD, SPRINGFIELD, OHIO, U. S. A.

THE LEADER IN COMPACTION EQUIPMENT DESIGN AND MANUFACTURE

The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

Why not write for full particulars today? Once you use Globe Form Grease, you'll understand why engineers and contractors hail it as the "wonder grease" for concrete forms.

Write for interesting literature on "Rubarite", a sensational new synthetic rubber product for rubberized asphalt paving.

OILS and GREASES
for every purpose
DIESEL
STEAM
AUTOMOTIVE

Write for descriptive booklet of all Borne, Scrymser products.

BORNE SCRYMSER Since 1874

Our Laboratory Facilities are always at your disposal

BORNE, SCRYMSER COMPANY ELIZABETH, N. J. • CHARLOTTE, N. C.

CONCRETE . . .

Continued from page 126

must be analyzed to select the proper equipment to fulfill the requirement economically, both from the viewpoint of the designing engineer and of the contractor. The proper selection for each particular job is important. Three check lists (published in CM&E, April '55, p 128) will be of assistance in selecting the proper equipment. These check lists take into consideration that:

1. The specifications will determine certain equipment requirements.

2. The job conditions relative to terrain, material supply, or delivery, quantity of concrete, hourly requirements, elevations, etc., will determine certain equipment requirements.

3. A careful study of specifications and job requirements will summarize into a final choice of method and equipment for efficient operations.

Use of the check lists will eliminate errors and assist in building the project, whether it is a simple building or the largest dam.

* * *

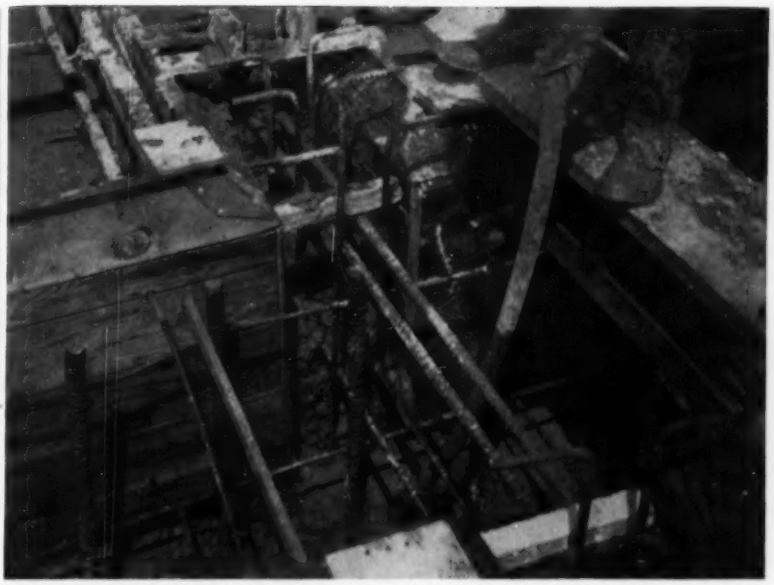
The next article in this series will appear in the June issue.

Flicks...

Seven Steps to Safety—A new half-hour color film presenting dramatically the seven point check—a practical method of brake inspection. Non-technical in approach, it also shows the amount of research and development behind the production of high-grade brake lining. Available from the **Raybestos Division, Raybestos-Manhattan, Inc., Bridgeport, Conn.**

Ten Days Per Man—A new 16-mm color film by the **Euclid Div. of the General Motors Corp., Cleveland 17, Ohio,** derives its title from the road-building methods of pioneer days when every able-bodied man was required to give 10 days of labor annually on road construction. The film, with a running time of approximately 26 min, illustrates the need for public support of public works and shows how modern methods and equipment can provide better roads at the lowest cost.

(Advertisement)



PROPER VIBRATION AND GOOD FORMS used in this well-planned box girder intersection make it easy to produce the best possible concrete. Good vibration technique is simple with good equipment, and . . .

Vibration Know-How Produces Better Concrete the Easy Way

One of the many ways experienced concrete foremen get maximum benefit from vibration is by planning concrete placement so each new dump is backed into a previous dump. This results in a smooth surface (no rock pockets) with maximum bond and greater strength. In the above photo the workman has just finished vibrating a dump at the center of a box girder intersection. As each succeeding dump is placed he will vibrate from the center outward, working it into concrete previously placed in the side members.

Appearance of sheen on the surface of the concrete gives visual indication that vibration is complete. With the modern high frequency vibrators pioneered by VIBER this requires only about 10 to 30 seconds, depending on the characteristics of the concrete.

• **Vibrator Operators** soon develop a "feel" which tells them the exact condition of concrete during vibration without seeing it. An experienced operator depends on this "feel" and the sound of his vibrator more than on the appearance of the concrete to tell him when vibration is completed.

Experienced operators describe the feel of concrete when the vibrator is first inserted as "rough" and "rocky." In a matter of seconds it "smooths out" and becomes "creamy," at which point vibration is complete and the unit may be removed from the concrete.

• **Good Forming** and proper vibration are essential where finished appearance is important, as it was on this overpass built by Erickson, Phillips, and Weisberg as part of the East Bay Freeway in Oakland, California. Tight forms made of well-seasoned lumber adequately braced can take full advantage of vibration to produce smooth, rock pocket-free concrete. VIBER'S replaceable rubber tipped vibrators are specially designed to prevent any damage to such forms, which might cause blemishes on the finished concrete surface.

• **For further information** on VIBER'S complete line of internal and external vibrators, contact your authorized distributor or VIBER COMPANY, 726 South Flower Street, Burbank, Calif., Dept. 75

VIBER

CONCRETE VIBRATORS SINCE 1931

For faster job-cycles make it 2-Cycle Power

SPECIFY GENERAL MOTORS DIESEL

in all your construction equipment

MODERN 2-cycle design is the main difference between GM Diesels and most other Diesels built today.

Two-cycle design means power on every piston downstroke. This is one of the reasons why a General Motors 2-cycle Diesel accelerates faster, responds to governor controls quicker, takes sudden shock loads in stride.

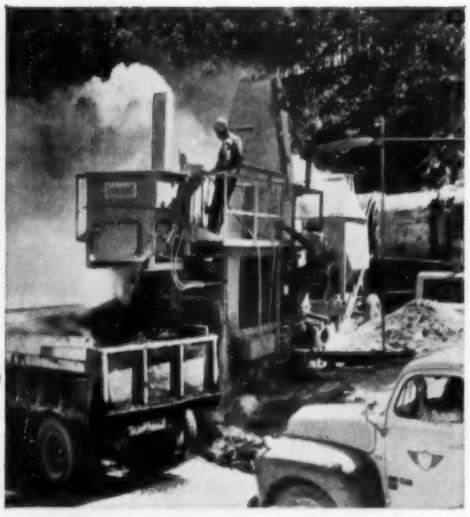
That means more work per shift from your equipment—means you can handle bigger contracts with fewer units, keep your capital investment down and your profits up.

But you get more than faster work when you *specify* GM Diesel power.

You get engines that are easy to service and maintain, that help you keep parts stocks low because of the high degree of parts interchangeability. You get engines that start at the push of a button with no auxiliary, even in wet weather and when it's cold.

And you get Diesel engines backed by a network of GM Diesel distributors ready to supply fast service and quick delivery of low-cost factory parts where and when you need them.

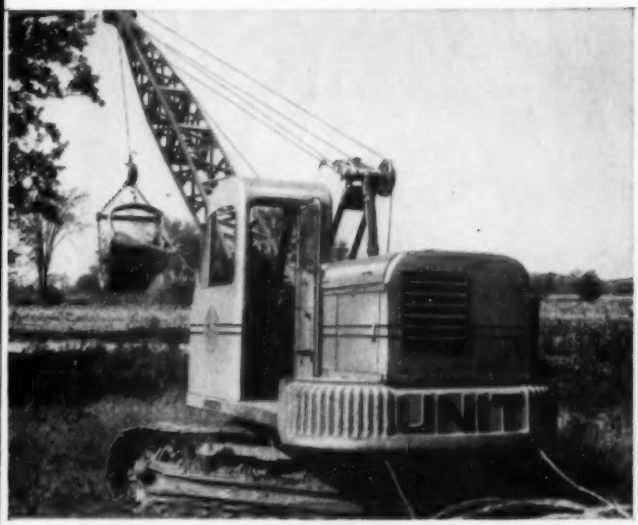
Today you can specify GM Diesel power in over 750 different models of equipment built by more than 150 manufacturers. Get their names from your local GM Diesel distributor or write direct for the list.



"QUICK SERVICE WHEN I NEED IT"

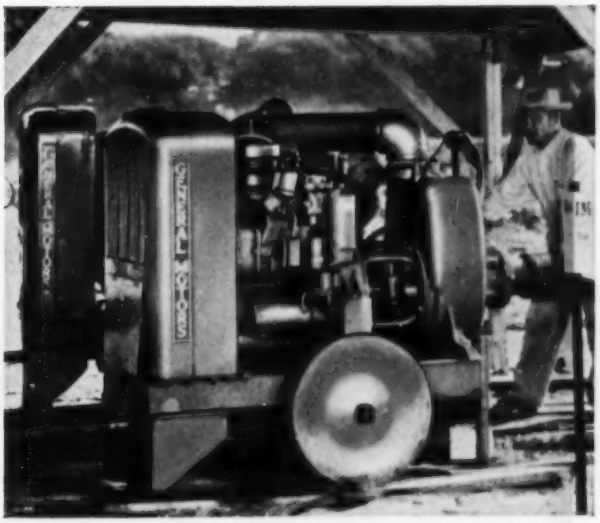
Iowa's Gene McClain Construction Company has GM Diesel power in this Cedarapids asphalt plant and in a shovel. Superintendent Jim Grundy says, "We've standardized on GM Diesel power for this operation because GM Diesels are economical to run. Dealer service is quick and good . . . the company stands behind their product."

GM
GENERAL MOTORS
DIESEL POWER



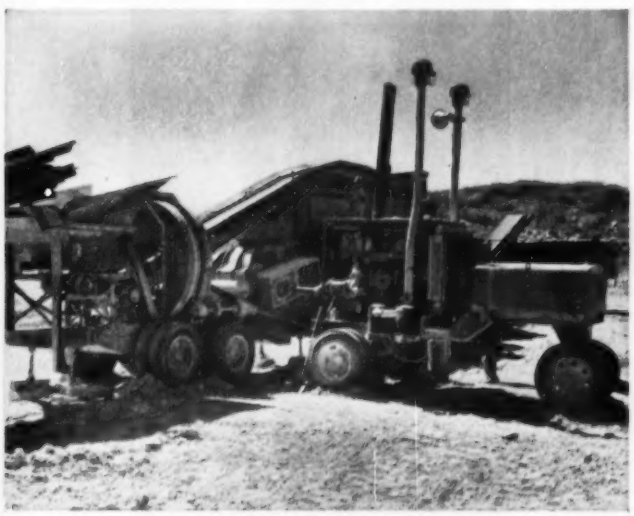
MOVES 1000 YARDS IN 10 HOURS

And that's big production for a ¾-yard dragline. This GM Diesel-powered Unit has been working for Michigan contractors, Henry Schmid Sons, since 1946. Its General Motors 2-cycle Diesel burns about 12 gallons of 14.9¢ Diesel fuel a day—cost only $100 for repairs in more than 17,000 hours of operation.



MULTIMILLION-DOLLAR DEPENDABILITY

Faced with wet footings on this multimillion-dollar sewage plant contract, Pittsburgh's Rust Engineering Company put GM Diesel-powered Jaeger dewatering pumps to work. Superintendent P. J. Pedone says, "The GM Diesel engines have proved very satisfactory . . . they're keeping footings dry so we can go ahead with the job."



3 GM UNITS ALMOST DOUBLE OUTPUT

Kansas' Reno Construction Company reports their new Cedarapids portable rock crusher with three new GM Diesels stepped up output from 200 tons per hr. to almost 400 tons. One "6-110" Diesel powers the primary 36" x 45" double impeller impact breaker; a GM Twin "6-71" powers the secondary and a "3-71" powers the conveyors, screen and feeders.

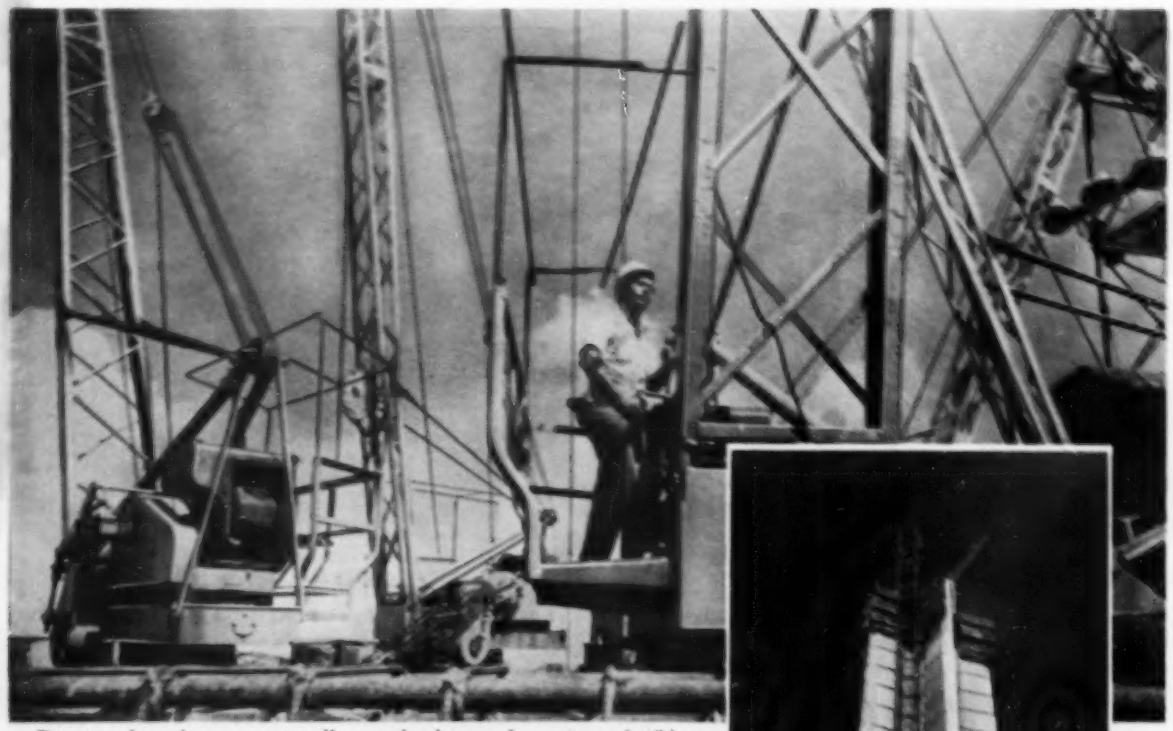
25% MORE WORK FROM GM DIESEL POWER

One of the best known excavating companies in Northern New Jersey and New York State is Raymond L. Cole Construction Co. "Our GM Diesel-powered American shovels do at least 25% more work than other Diesels in the same number of hours. They are more flexible," reports this user of one 1½- and three ¼-yard shovels . . . all GM powered.

DETROIT DIESEL ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines . . . 30 to 300 H.P. • Multiple Units . . . Up to 893 H.P.



This view shows how compact, self-contained Whirlettes operate in close quarters. Small foundation area and the absence of guy wires and stiff legs permit efficient use of limited working space. Operator always faces the load

5 CLYDE WHIRLETTES "STAR" ON HAVANA'S STAR-SHAPED MARTI MONUMENT

Five points . five Clyde Whirlettes! A simple and effective symmetry of method matches the symmetry of design as the unique monument rises in Havana, Cuba. Honoring the Cuban patriot Marti, this 330-foot structure is being built in the shape of a five-pointed star. A compact, self-contained Clyde Whirlette on each point provides safe, efficient material handling to keep construction on schedule.

NO GUY WIRES • FULL REVOLVING • SELF-CONTAINED

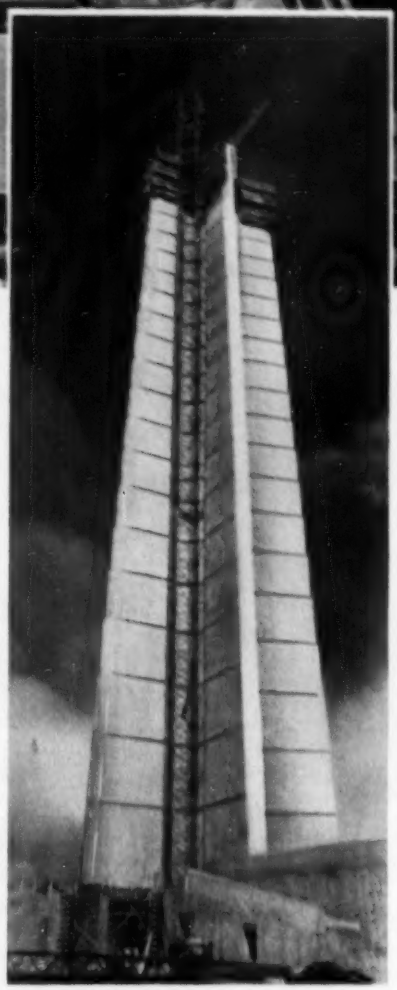
Full revolving, self-contained Clyde Whirlettes prove star performers wherever they are used. Compact, they need only the barest minimum of foundation space, full-revolving, they service large areas. Both features pay off in faster schedules, lower costs. With no guy wires or stiff legs needed, Clyde Whirlettes work efficiently even in congested areas. The operator turns with the boom . . . always faces load and work.

Clyde Whirlettes are available with either electric or gasoline power, either manual or mechanical swing, in two popular sizes

Model W-3 Whirlette, two drums for hook work only Capacities from 10,000 lbs. at 10 ft. radius to 2,000 lbs. at 40 ft radius

Model W-45 Whirlette, two or three drums for hook work or clam shell. Capacities from 24,000 lbs at 10 ft radius to 2,500 lbs. at 60 ft. radius.

Complete facts on Clyde Whirlettes should be an essential part of your equipment information file. To have these facts in handy, easily-referred-to form, write for descriptive literature



How to work upon a star! On top of this 330-foot star-shaped monument, five, work-hungry Clyde Whirlettes are located, one on each of the five points.

HOISTS—DERRICKS—WHIRLEYS—BUILDERS TOWERS—CAR PULLERS—HANDI-CRANES—ROLLERS

CLYDE

CLYDE IRON WORKS, INC.

Established in 1899

DULUTH 1, MINNESOTA

ONE OF THE 16 INTEGRATED COMPANIES BARIUM STEEL CORPORATION

HEFTY LOAD OF DIRT is rolled ahead by D9 bulldozer as it plows through spring mud. Latest and largest addition to Cat's stable of tractors, the new D9 is being produced in both direct-drive and torque-converter models. Its engine develops 286 hp.

First Turbocharged Tractor Bows In

A CM&E Equipment Development Report

CATERPILLAR'S NEW D9 TRACTOR, now coming off the production line, is a 54,000-lb, 230-dbhp giant. Despite its size and power the crawler is agile. As John Jass, Cat's chief engineer puts it: "It's a light-footed machine. It's not a big hulk that would need a whole countryside to operate in, nor a 7-ft operator. It's quick, has good balance, and the operator feels he's in charge."

Part of the big rig's zip comes from a turbocharger (used here for the first time in a crawler tractor) that kicks 286 hp out of the 6-cyl engine. Yet, paradoxically, hot-rod operators may not appreciate this feature at first: The turbocharger reduces noise and eliminates individual cylinder "bark," sometimes giving the impression that a wide-open engine is running at part throttle. No matter, the power is there.

So are power-assisted controls and other operator conveniences. For as capital investment in a machine goes up (a bare D9 is pegged at $31-33,000 fob Peoria), the operator becomes increasingly more important. So on the D9 he's given such things as in-seat starting, hydraulically boosted clutches and brakes, and a fancy sponge-rubber seat he can adjust while sitting on it.

Behind these and other D9 features, and behind the cold specification figures in the accompanying table, of course, lie many years of development work and much field testing.

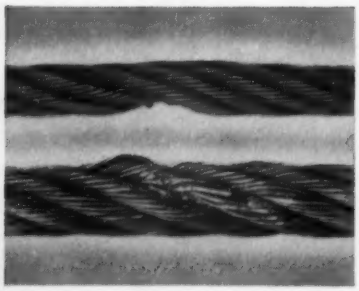
It was an open secret one year ago that Caterpillar was putting ten experimental tractors—D9X's—into contractors' hands for tests. One purpose was to let the users evaluate the machine on a wide range of applications under typical, yet severe, job operating conditions. In all, on an average of three different jobs each, the ten X's racked up some 20,000 hr on multiple-shift work in all parts of the country.

Each machine was operated by regular contractor personnel. But it was shepherded by a Cat research engineer who lived with it continuously to report tractor performance and contractor-user reactions.

Results confirmed Caterpillar's belief that there was need for a larger tractor than was then on the market. The manufacturer all along has felt that the ordinary "big" tractor would remain the contractor's work horse—that in most cases it would be complemented, rather than replaced, by the more powerful unit. But, they figured, on such heavy-duty operations as push-loading scrapers, pioneering, ripping where blasting formerly was required, and land

(Continued on page 136)

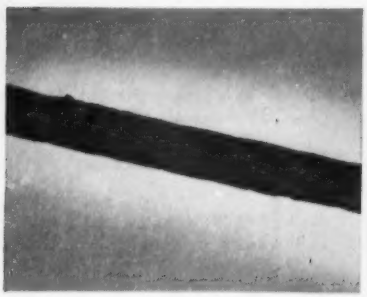
Tuffy tips on preventing



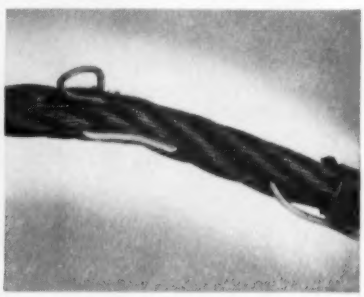
These two photos show what happens when rope is run over or struck by a hard object and crushed. The damage to the strands greatly reduces the service life so carefully built into the rope.

Sudden release rebound from an overstressed condition may often cause birdcaging. Throwing a loop into the rope is also a major cause of birdcaging. Lang Lay ropes in particular are vulnerable to this abuse.

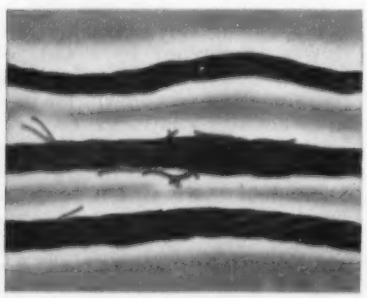
Severe corrosive water conditions caused rust and corrosion to produce a one-strand break in this rope. Lubrication during the time the rope was in service would have retarded the damage . . . added greatly to the rope's life.



If broken in improperly, high strands like these may result. When installing, make sure that the fabricated relation between *strand with strand* and *strands with core* are not changed.



Nailing a wire rope through the core often causes many undesirable results. The wires and the core are badly damaged. A high strand may develop near the end or many feet away.

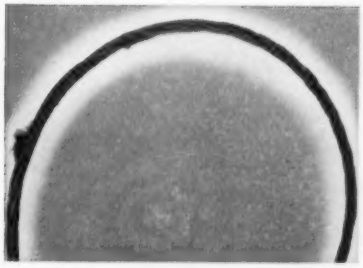


Here are three types of open kinks, all resulting from mishandling of wire rope. Guard against kinks by winding rope properly on the drum, and *never* pull a loop smaller, always enlarge it then straighten out the rope.

The start and finish of doglegs; the end being the point when all the wires on one side of the rope were worn through. Anything, such as a pulled loop, that causes a permanent bend or "set" will result in a dogleg.

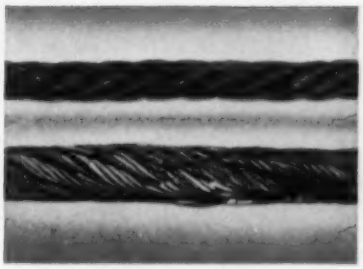
While different wire rope is constructed to resist abrasion to different degrees, improper use leads to injury. Watch for abrasion and when it begins to show locate the point where it is occurring and correct the cause.

damage to *Wire Rope*



When a popped core occurs, continued use causes the rope lay to lengthen out considerably. This displacement of the core is usually caused by load tension being suddenly removed from the rope.

Here is an example of excessive pinching in the sheave grooves. This rope lasted through only 1½ hours of service. To prevent pinching, make sure grooves are not worn deep and that the bearing surface is sufficiently large.



Excessive drum crushing like this occurs at points of cross-over or when rope is wound unevenly. Check for even winding of each layer on the drum to prevent crushing of this type.

Put the Knowledge of Specialists to Work on Your *Wire Rope* Problems

Their years of field-testing experience and solutions arrived at and proved both in the field and in our outstanding wire rope laboratory are yours to make use of whenever a rope problem confronts you.

In addition to standard wire ropes, Union Wire Rope specialists have produced a family of wire ropes for special purposes. Ropes that give you the construction, type of steel and characteristics best suited to each particular job for which each of the Tuffy Wire Ropes is especially designed and constructed.

The Tuffy Ropes they have developed make ordering easy and *sure*. Next time you want wire rope, just...

Say **Tuffy**—No Need For Complicated Specifications

Tuffy Scraper Rope
Mount a reel on your scraper and move more yardage per foot. Flexible to resist sharp bends, stiff enough to resist looping and kinking.

Tuffy Dragline
Rides smooth on drums and hugs the drum when casting. Extra flexible, yet constructed to give maximum abrasive resistance.

Tuffy Dozer Rope
Mounted on special 150' reel that lets you use rope you now throw away! Increases service life and reduces down-time. 1/2" and 9/16".

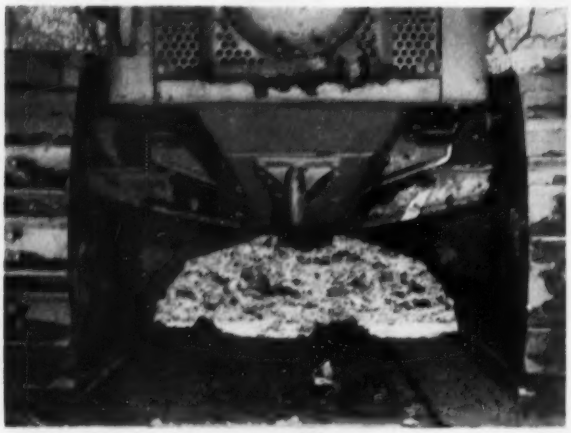
Tuffy Slings & Hoist Line
A hoist line that gives you extra service life. Slings of 9-part machine-braided wire fabric fight kinking — a matched team of balanced performers.

Your Union Wire Rope Distributor Is Good At Solving *Wire Rope* Riddles. When you have a wire rope problem, give your Union Wire Rope distributor a call for hurry-up service. Chances are you'll find he has the correct answer at hand—because part of his job is figuring out how your equipment can give you the best operation, at the lowest operating cost! Feel free to call on him anytime.

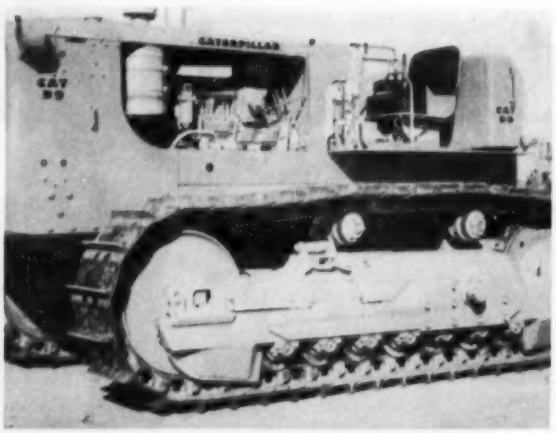
union *Wire Rope* **corp.**
2174 Manchester Avenue, Kansas City 26, Mo.

2-C *Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric*

TURBOCHARGED TRACTOR . . . Continued from page 133



ORDINARY LEAF SPRINGING has been eliminated in the D9, whose front-end suspension is a bar sprung to the track frames. Bar ends rest on rubber sandwich pads, as shown in photo to right.



OPERATOR COMFORT is provided by sponge-rubber seat that he can tilt or move fore and aft without leaving. Master clutch, steering clutches and brakes are power assisted for operating ease.

clearing, the larger tractor would be superior.

Field tests proved this. On one such job in Dakota for instance, a single D9X equalled four D8's in clearing cottonwood trees: The big machine could topple them without first making root passes. Field evaluation by the users also confirmed that both direct-drive and torque-converter models should be produced.

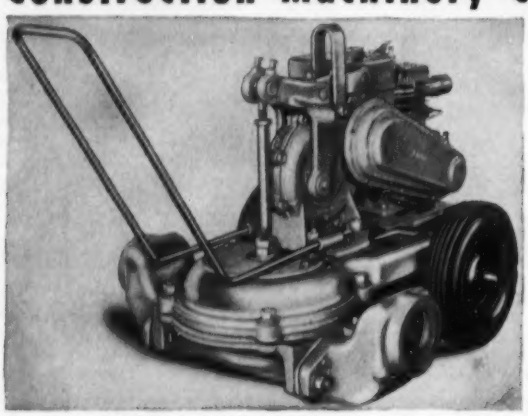
One equally important purpose of field testing was to evaluate performance of various component designs, so all ten machines were different. Some had six- and some had seven-roller track frames, for example. When the seven-roller units proved better, particularly for stability when backing up hill, that design was standardized for the production-model D9.

Field testing also helped catch ahead of time what one engineer calls "the nits and lice that other-

(Continued on page 140)

(Advertisement)

Two revolutionary new pumps announced by Construction Machinery Company, Waterloo, Iowa

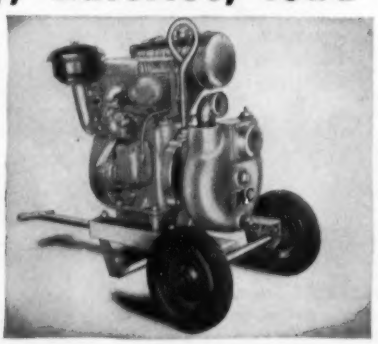


A NEW TYPE VARIABLE-SPEED, VERTICAL-STROKE PLUNGER that assures a much longer diaphragm life and greatly increased efficiency, is a real money-saving feature of CMC'S new SKWEE-GEE diaphragm pump.

A combination 2" and 3" pumper, the SKWEE-GEE is now the best pump in the business for jobs ranging from de-watering to pumping sludge. Can't be beat for high suction lifts, seepage control, small well-point de-watering jobs.

SKWEE-GEE primes dry at 25 feet. Provides total heads up to 40 feet. Standard plunger stroke 3" with alternate 2¾" by simple adjustment. Briggs air-cooled engine.

Write for Bulletin FD-L3-55. **Construction Machinery Company,** Waterloo, Iowa.



TWICE THE PRESSURE of ordinary single impeller pumps is delivered by CMC'S new and different 2-stage dual primer, Model TS-7.

A 1½" pumper with unique type impeller, it's excellent for such jobs as pumping through extended lines and washing equipment. Fine for suction lifts up to 25 feet.

Write for Bulletin TS-7, **Construction Machinery Company,** Waterloo, Iowa.

A Complete Line of Dual Primers from 1" to 10"

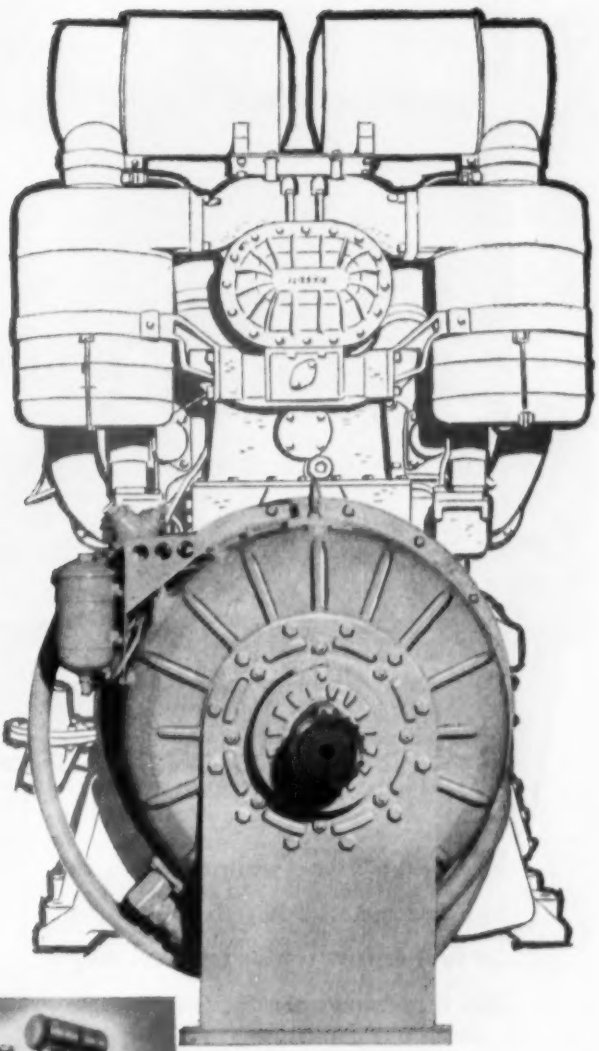
more flexibility
more wear life
more work

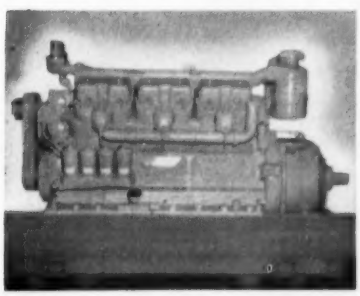
from new

CATERPILLAR

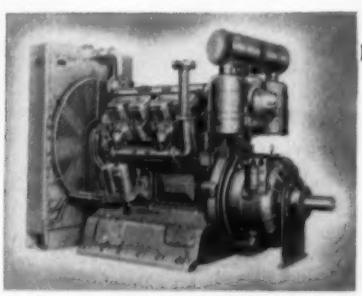
Torque Converter

Power Units . . .





Caterpillar Torque Converter Power Unit — a Model D386 Cat Diesel working through Twin Disc Model CF Torque Converter.



Cat D375 Torque Converter Power Unit. Twin Disc Torque Converters are standard equipment.

Twelve different torque converter arrangements are available for six Caterpillar Diesels, up to 493 hp. Twin Disc also provides a wide choice of output shafts, for both in-line and side loads.

FOR THE FIRST TIME, you can order any one of 6 Cat Diesel Engines *Torque Converter-equipped at the factory . . .* as complete Torque Converter Power Units, developed through design teamwork by Twin Disc and Caterpillar engineers.

The result is *tremendous* performance—for power source and power linkage are *ideally* matched.

To give you a quick idea of how much Torque Converters mean to modern diesel power, here are a few facts you'll want to remember: on the new Cat Power Units, the Twin Disc Torque Converters • *match torque output automatically to the load* • *start loads smoothly* • *provide control of load movement without using clutch* • *prevent overloads from killing engine* • *permit hovering or holding under power* • *keep engines operating in maximum efficiency range at all times.*

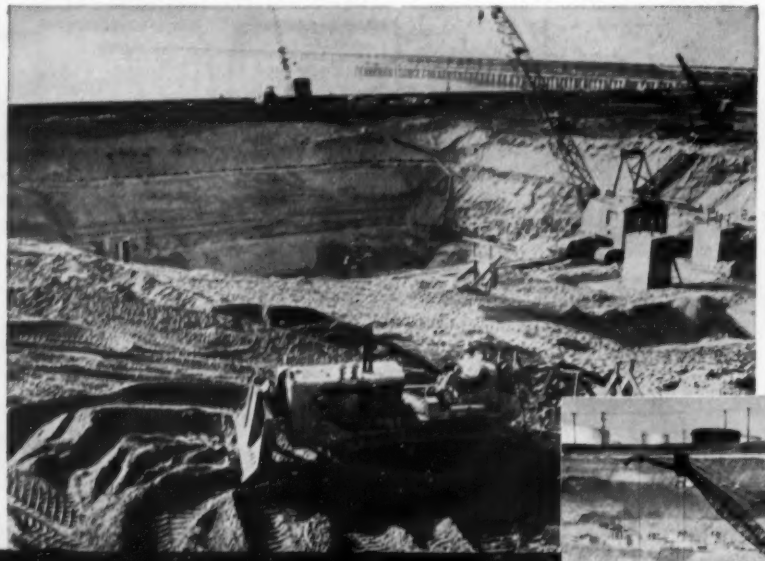
Whether you're thinking about a new power unit or planning to replace a present one, find out how much *more* flexibility, *more* wear life, and *more work* you'll get *through Twin Disc Torque Converter Drive.* Contact your engine dealer . . . he'll give you the facts and figures.

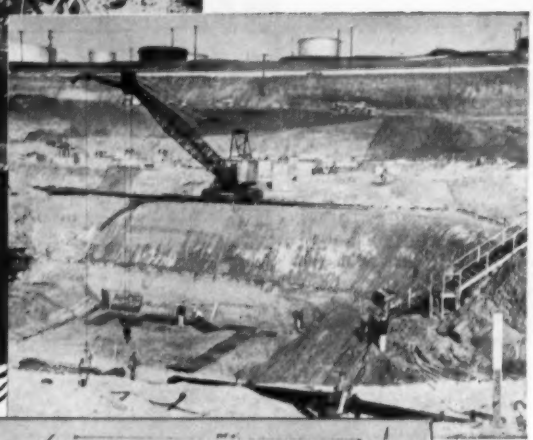
In the meantime, if you want more details on other Industrial-Type Torque Converters, write Twin Disc, Hydraulic Division, Rockford, Ill., and ask for Bulletin 135-D. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

TWIN DISC

TWIN DISC

Torque Converters

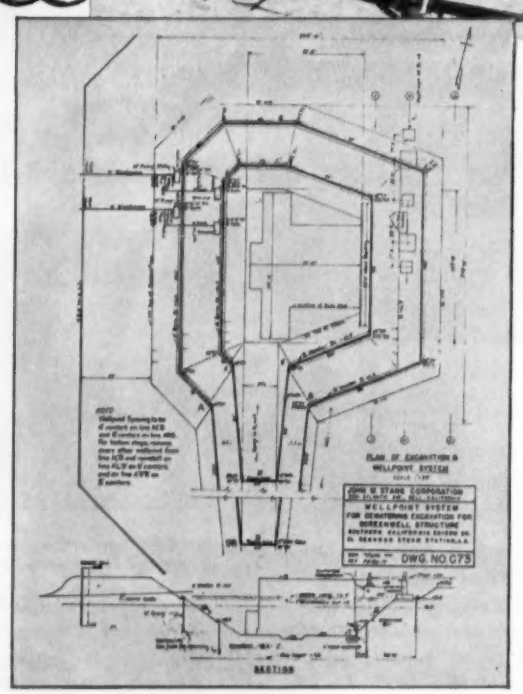




DRY WORK...
water under control!

STANG wellpoint job in beach sand...Down to 60 feet—30 feet below water level...*only 500 feet from ocean!*

Plans for an oceanside steamplant power station called for the construction of a reinforced concrete screenwell structure. Water and soil conditions were extremely adverse. The John W. Stang Corporation Engineering Service was called in. The resultant STANG plan (illustrated) *provided* completely dry excavation from the surface to a 60 foot depth ... *utilized* dry-land excavation equipment 30 feet below water level ... *made possible* the use of low-cost concrete forms. For fastest low-cost, construction when water is a problem ... call STANG!



Putting water in its place

STANG ...anyplace!

#551

JOHN W. STANG CORPORATION

Engineers and Manufacturers of Unwatering Equipment, Wellpoint and Pumping Systems
Unwatering Planning—Equipment—Service

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LOgan 5-7421

OMAHA, NEBRASKA
2123 South 56th Street
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TACOMA, WASHINGTON
2339 Lincoln Avenue
BRoadway 4367

THE NEW UNIVERSAL 293Q TWINDUAL PACEMAKER

combines peak production with maximum portability

TOP CAPACITY PRODUCTION

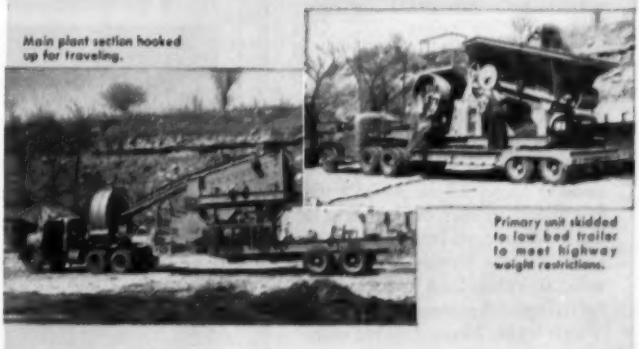
The TwinDual Pacemaker gives you three full stages of reduction for top capacity—a Universal overhead eccentric jaw crusher in the first stage and a TwinDual roll crusher for the second and third stages.

No other single unit plant offers so many big-profit advantages. Big primary jaw crusher accepts large rock—lets you work gravel pits containing big boulders. Exclusive TwinDual two-stage roll crusher gives top capacity secondary crushing. Its high ratio of reduction permits the primary jaw to operate at 50 to 100% wider discharge opening. This results in greater capacity—less jaw wear. Larger inclined gyrating screens with full screening area allow 20 to 25% greater output. All operations from apron feeder to delivery conveyor are driven through one single power unit.

For top capacity with three stages of reduction—and a bonus in longer crusher life, lower horsepower requirements and a better quality finished product, choose a Pacemaker. Available in five models for pit or quarry operation. Get complete profit making facts now.

LOW TRAVELING WEIGHT

The primary jaw crusher, apron feeder with grizzly by-pass, operator's platform and structural supports are all mounted as a single unit on skids. This primary unit is bolted to the main truck frame. When highway weight limitations must be met, this unit may be quickly skidded to a low bed trailer and transported separately.



Main plant section hooked up for traveling.

Primary unit skidded to low bed trailer to meet highway weight restrictions.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
327 8th Street, N. W., Cedar Rapids, Iowa
Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

COMMENT
from the
BUTLER ENGINEER

Butler Makes Fortune (April Issue)

We've just learned that Butler Roadbuilders Plants are to be a feature of an article in FORTUNE which discusses the 100 billion dollar Highway Program.

We've always suspected Butler equipment was tops but it pleasures us no end to have our suspicion substantiated by our selection for this great magazine.

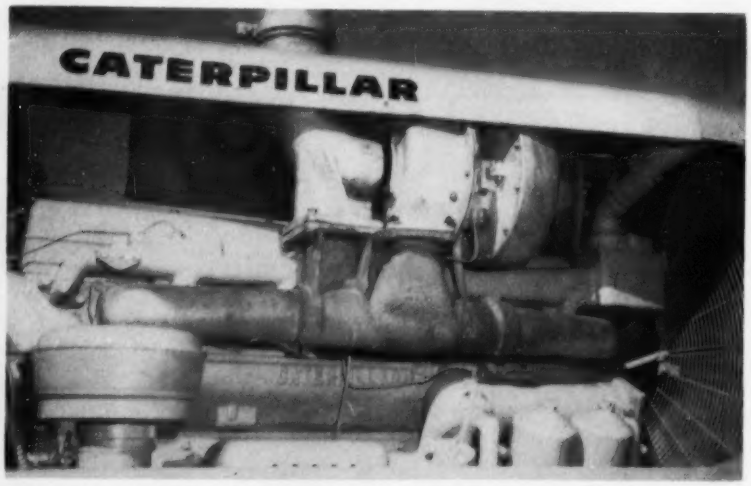
This article will, in part, deal with the Turnpike type of construction for which Butler Bin has developed an electronic, *one-man-operated,* completely automatic Roadbuilders Plant. Incidentally, as if one-man-operation is not important enough, these new Butler Plants are far and away the most portable ever built. Any questions? Please write.

The Butler Engineer — in fact everyone in the organization — not infrequently goes to unusual lengths to lend a helping hand. F'r instance, a customer ordered a Ready Mix Plant. Gonna erect it along a track out in the country beyond the edge of town. Got his garage and shop built when suddenly everyone in the area raised a sky-shaking squawk. This despite the fact that the location had been zoned for industrial development for 30 years . . . Our customer 'phoned me and asked me to meet with the Town Board at a public hearing — at 8:00 P.M. of a Saturday night. Nice time for a meeting. But I grabbed a 'plane and flew several hundred miles to speak my piece in our customer's behalf. Won't go into details, but some of the hysterical protests were so ridiculous as to be side-splitting. Anyway, "It was a tough fight, Mom, but we won."

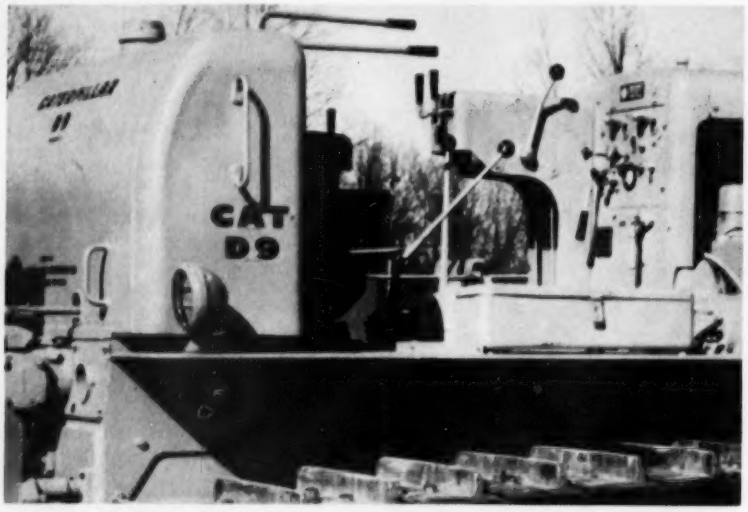
Look at FORTUNE — April Issue.

The Butler Engineer

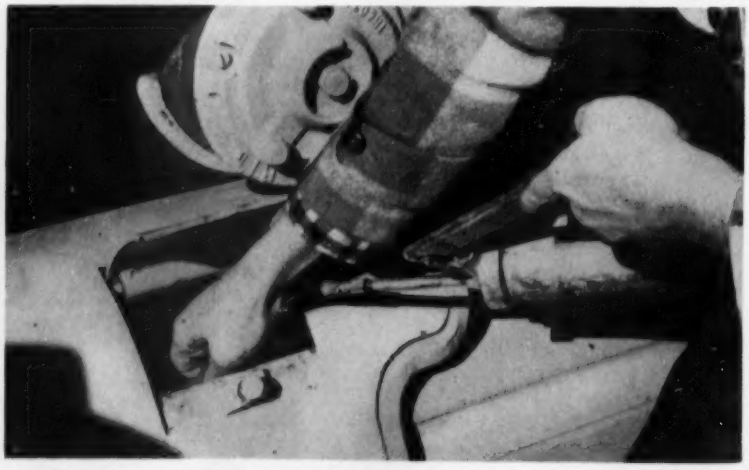
BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



TURBOCHARGED ENGINE in D9 marks a "first" in crawler tractor field. Turbocharger has an impeller driven by exhaust gases and shafted to a blower that feeds air to the engine.



CONSOLE-TYPE CONTROL PANEL is an operator convenience, and he can reach all starting engine controls from his seat. Fuel tank has been streamlined for better rear visibility.



HYDRAULIC TRACK ADJUSTMENT is operated by a grease gun. Another service feature is that engine can be removed without disconnecting gage lines and starting engine controls.

wise would bother you and add to service costs." In this category, but rather more than nits or lice, were the D9X's brakes—they showed wear and fading when heated up by operation. Solution (standard in the D9): a centrifugal blower connected to the engine to pump filtered air through each of the brake compartments to keep them cool.

One prime recommendation from D9X users was that the machines be given more power. This was not unexpected, for they were sent out with a 200-dbhp engine fitted with a gear-type blower. Meanwhile, undergoing tests at Cat's proving ground, were two more D9X's with engines whose bore was ½ in. larger and which carried a turbocharger. (New to tractors but long used in aircraft, a turbocharger is basically an air blower driven by an impeller spun by the engine's exhaust gases. As a rule of thumb, a turbocharger can add as much as 50% to the horsepower of a naturally aspirated engine, while a gear-type blower adds but 25%.) The more powerful engines now drive the D9's.

Many other items either were proved out or changed as a result of the field tests. For instance, the D9 tractors have a new type of front end suspension—an oscillating transverse bar whose ends are sprung to the track frames. That's because a leaf spring to carry the great weight would have been too rigid, and would have been so deep that it would cut ground clearance considerably. When coil springs at the end of the bar broke too often, the design was changed to replace them with resilient rubber sandwich pads.

Rear Timing Gear Train

Tests also proved the value of such things as the D9's hydraulic track adjuster that is operated simply by a regular grease gun; its lock-up device on the torque converter for push-starting when necessary; and a constant-drive power take-off for rear-mounted equipment. (The D9's engine has the timing gear train at the rear so it is easy to take off, by shaft, direct from the engine. Thus the PCU has direct power regardless of clutch, transmission or torque converter operation. The gear train also operates pumps for clutch and brake boosters.)

Some of the D9X-to-D9 changes were seemingly minor. For better operator visibility, configuration of

. . . with dependable, long-lasting J-M Asbestos Friction Materials

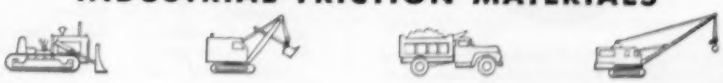
OUTSTANDING PERFORMANCE and long service life have made Johns-Manville Friction Materials the first choice among manufacturers of shovels, bulldozers and trucks.

These specially engineered linings and facings are instantly responsive to light or heavy pressure, will give dependable braking, pin-point accuracy and greater durability whatever the service conditions. Their performance features pave the way to getting the most out of your equipment, help you meet schedules, hold down operating costs.

All J-M Friction Materials are designed for the specific job each has to do. They are available in assembled sets that have been specially engineered to match the requirements of industrial machinery.

For further information about these industrial friction materials, write to Johns-Manville, Box 60, New York 16, N. Y.

Johns-Manville
INDUSTRIAL FRICTION MATERIALS

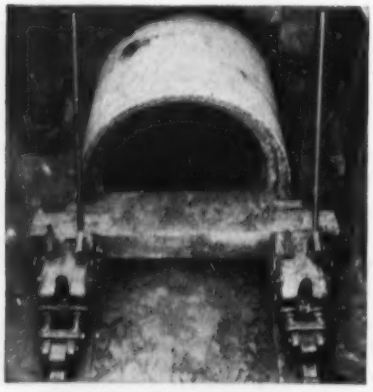


SAVE HOURS,

CUT COSTS ON YOUR

PIPING JOBS

PUSH PIPE UNDER STREETS, TRACKS, walks, floors and other obstacles with a GREENLEE Hydraulic Pipe Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, back-filling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes—model shown above for pushing ¾ to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump also available for extra ease and speed of operation.



GREENLEE

Write today for descriptive literature. Greenlee Tool Co., 2185 Columbia Avenue, Rockford, Illinois, U.S.A.

engine hood and fuel tank were altered and the exhaust stack relocated. The fuel filler cap was moved off center to prevent spillage on the operator's seat during filling. The radiator cap was shifted to one side for easier filling, and grab irons were added for safer mounting and dismounting.

But regardless of the size of the changes or their individual importance, they were made with the contractor's and operator's interest in mind. In its well-tested new D9, Caterpillar Tractor Co. has given the contractor a big and husky new crawler which, it is convinced, will serve him well.

D9 Specifications

(Direct Drive)

RATED HORSEPOWER:

Drawbar	230
Engine at flywheel	286

OPERATING PERFORMANCE: Forward & Reverse

Gear	MPH	Rated Pull (lb.)	Max. Pull (lb.)*
1	1.6	54,200	60,860
2	2.1	41,600	46,710
3	2.9	30,250	33,970
4	3.9	21,000	23,580
5	5.0	14,840	16,670
6	6.8	9,720	10,920

*Calculated from rated pulls. Depends on traction and weight of fully equipped tractor.

ENGINE:

Four-stroke cycle, valve-in-head, diesel	
Cylinders (No.)	6
Bore and stroke (in.)	6¼x8
Displacement (cu in.)	1,473
RPM-governed at full load	1,200
RPM-at max. drawbar pull	800
NACC hp for tax purposes	93.6
Lubrication (full flow filtering)	Full pressure
Crankshaft: hardened journals	Hi-Electro
Bearings (steel-backed aluminum alloy)	7 main
Fuel injection system	Caterpillar

FUEL: No. 2 fuel oil (ASTM Spec. D396-48T) Minimum cetane, 35.

STARTING METHOD: In-seat; independent 2-cyl. gasoline engine with 6-v electric starter.

CLUTCH: Oil-type, four metallic-faced plates, over-center engaged. Hydraulically boosted. Clutch lubricated and cooled by oil under pressure.

TRANSMISSION: Unit construction. Selective-type speed change. Constant mesh helical gears. Filtered full-pressure lubrication for bearings. Oil spray directed on gears.

FINAL DRIVE: Filtered full-pressure lubrication.

STEERING:

Clutches	Multiple disk
Clutch friction material	Metallic
Friction surfaces (No., each clutch)	32
Inner clutch drum grooves	Helical
Brakes (air-cooled)	Contracting band
Clutch release and brake control	Hydraulic booster

TRACK ROLLER FRAME:
Reinforced box-section; adjustable two-position idler; track guiding guards.

Rollers (No. each side)	7
Oscillation (in.)	22½

TRACK:

Adjustment	Hydraulic
Shoes (No. each side)	43
Std shoe width (in.)	24
Grouser height (in.)	2 13/16
Track length on ground (in.)	129¾
Ground contact with 24-in. shoes (sq. in.)	6,228

CAPACITIES:	U. S. Gal.
Cooling system	35
Fuel tank	157
Steering clutch and brake control	4
Lubrication system:	
Crankcase	9
Transmission	15
Flywheel clutch	4½
Final drive (each)	13½
Recoil spring housing (each)	10

GENERAL DIMENSIONS:

Gage	90 in.
Length (over-all)	17 ft. 10¾ in.
Height	8 ft. 9 in.
Width (over-all)	9 ft. 11¼ in.
Drawbar height	21 21/32 in.
Ground clearance	21 3/16 in.

WEIGHT:

Dry, lb	54,000
Operating, lb	56,200

PRICE: Bare; fob Peoria, Ill. $30,750

Cat D9 Specifications

(Torque Converter Drive)
(Same as Direct Drive D9 except as noted)

OPERATING PERFORMANCE DATA:
Drawbar pull—Torque converter drive automatically adjusts drawbar pull to load within following speed ranges.

Gear	Forward	Reverse
1	0-4.1	0-4.1
2	0-5.8	0-7.8
3	0-7.8	

Maximum pull depends on traction and weight of fully equipped tractor.

CLUTCH AND TORQUE CONVERTER: 19 in., dry type, single asbestos-faced plate. Three-stage 5:1 torque converter using engine fuel for hydraulic fluid, cooled by water type heat exchange.

WEIGHT:

Dry, lb	54,450
Operating, lb	56,650

PRICE: Bare; fob Peoria, Ill. $32,900

COMING — In July

Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance. The theme will be "Productive Maintenance."

WATCH FOR IT!

WANTED
ONE PINT OF YOUR USED MOTOR OIL
REWARD
Big savings on engine repairs from information leading to the correction of hidden engine trouble.

Free used oil analysis keeps equipment on the job

By analyzing just one pint of your used motor oil, Pure Oil scientists can tell you what may go wrong with an engine, what would cause it and what to do about it *now* to prevent a costly breakdown.

This valuable service—called Pure-sure Used Oil Analysis—is offered free to Pure Oil customers. Now, to show you how helpful it can be to *your operation*, we want to give you a *free* Used Oil Analysis for one of your engines.

No cost. No obligation. Just call your local Pure Oil Company office or mail the coupon today.

This offer must be limited to the 24-state area where Pure Oil products are sold.

THE PURE OIL PURE COMPANY, U.S.A.

Sales offices located in more than 500 cities in Pure's marketing area.

Be sure with Pure

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35 East Wacker Drive, Chicago 1, Illinois

Without cost or obligation, please send me information on how I may receive a Pure-sure Used Oil Analysis of my used oil.

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City_____ **Zone**____ **State**_____

On-the-Job CONTRACTOR-LABOR RELATIONS

By LEON B. KROMER, JR.

Apprentice Training

How many times have you heard this: "I wouldn't mind paying a high wage scale if the men sent to my jobs were qualified"? Or something like this: "I never saw such poor workmanship. Why the man can't even read a blueprint"? These and remarks not so mild come from contractors who complain that building trades mechanics are not qualified for their jobs. In far too many cases this is true. Yet, what are contractors doing to correct the situation?

For too many years apprentice training has been considered a prerogative and responsibility of the unions; management had the right to expect the unions to furnish qualified mechanics. This is what W. C. Christensen, deputy director of the U. S. Department of Labor Bureau of Apprenticeship, has to say on that point: "The primary responsibility for training rests with industry—management and labor."

How Some Do It

In many areas in the country this attitude is being reflected in joint action by labor unions and contractors who have set up Apprenticeship Committees to run a training program. These committees screen applicants, establish a program of on-the-job and classroom training. Such a committee has been active for many years in Albany, N. Y., where the bricklayers, masons and plasterers union, the contractors, the New York State Apprentice Council and the Albany Board of Education cooperated to train about 25 young men a year as qualified mechanics of the trowel trades. These men attend classes in blueprint reading, bricklaying, cement finishing, plastering, etc., and each trainee works for a contractor for on-the-job training and experience. Classes are held twice weekly in city schools with equipment furnished by the Board of Education and, in some instances, by the contractors; material is donated by suppliers and both union officials and contractors participate in assisting the assigned instructor. From time to time a contractor speaks to the classes on practical job problems, techniques adopted on unusual or difficult construction projects. Any extra expenses of the school are covered by the union and the contractors.

Committees have been formed in other areas and are active in developing qualified building tradesmen. However, there are too many metropolitan areas where nothing is being done to develop young men into skilled craftsmen for the industry. At the same time, the average age of the mechanics

(Continued on page 148)

WISCONSIN-POWERED

Jackson Multiple Compactor

Achieves 98% Sand Compaction

on Garden State Parkway Project

When the Reid Contracting Co., of Woodbridge, N. J., was awarded the contract comprising grading and drainage from Route 9 interchange, north of Toms River to the S. Matedeconk River (Garden State Parkway, Sec. 8), one of the essential pieces of equipment required for the job was the Wisconsin-Powered Jackson Multiple Compactor, illustrated above.

The picture shows the vibrator compacting the sand fill enclosed by the abutment and wing walls of the bridge that will carry the Parkway over the Indian Head Road. Specifications called for laying down the sand in 12" layers, with 98% compaction in the top 4' of depth and 90% below. Tests by supervising engineers show that these requirements were met.

This is a typical assignment which, among other things, demonstrates the complete adaptability and heavy-duty serviceability of Wisconsin Heavy-Duty Air-Cooled Engines to Fit the Machine and the Job. These engines are used as standard power components on a great variety of construction machinery requiring power in a 3 to 36 hp. range . . . 4-cycle single cylinder, 2- and 4-cylinder models.

You can't do better than to specify "Wisconsin Power" for your equipment. For detailed data, ask for Bulletin S-164.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

If you're a big contractor who wants a slice of profitable commercial work . . .

If you're a new operator who wants to be sure of beating competition . . .

TEAM UP these two low-cost Cedarapids plants

Here's a team that can't be beat for making yourself a nice slice of profit on small to middlin' jobs . . . the ones that can be a profitable sideline for established outfits. . . or which are sure-fire money-makers to give new operators a flying start in the business.

Your investment is low and your "take-home" is sizeable, because each unit is low in price but high on production. Teamed up, they keep you on top of the job, from gravel, pit or quarry to bituminous surfacing.

Cedarapids — Built by IOWA

SINGLE PASS CRUSHING PLANT

The Single Pass Plant shown above produced 40 tons per hour of ¾" rock and gravel, 60 tons per hour of 1", and from 67 to 90 tons per hour of 1½" aggregate. That's the kind of production that lets small operators as well as big outfits make money on road maintenance work, city streets and alleys, small State contracts, base or blanket course jobs, and other jobs where portability and fast set-up are important.

The Cedarapids Single Pass is the most practical plant of this type available. It has plenty of screening capacity, and the hopper and feeder *on the rear end* let you back right up to the nearest gravel bank and start producing *two sizes* of material immediately. Simple design, with few moving parts, keeps maintenance costs low.

Cedarapids — Built by IOWA

Model CM "COMMERCIAL" BITUMINOUS MIXING PLANT

Rated at 40 tons per hour, this Model CM "Commercial" Plant averaged 45 tons per hour! The peak production on the job was recorded at *47 tons per hour!* With this kind of output, Model CM owners are turning a tidy profit on jobs such as surfacing city streets, driveways, parking lots, playgrounds and other commercial type work.

The Model CM twin shaft mixing unit can be used alone to produce cold mix, or combined with a 4816 "Packaged" Drier for turning out hot mix or high type bituminous concrete. The use of a Model CGC Gradation Control Unit assures meeting strict State specifications accurately. Addition of a Model BH Feeder completes the set-up for highly profitable operations.

IOWA
MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

FOR YOUR BIG JOBS BUY THESE CEDARAPIDS PLANTS

Double Impeller Impact Breaker

Hammermill Secondary and Portable Double Impeller Primary

Model G60 6000-lb. Bituminous Mixing Plant

P&H MITI-MITE® (Model 55TC) on road work in Colorado

P&H Model 155, ½-yd. dragline working near Tulsa, Okla.

P&H ...20 YEARS OF ALL-WELDED CONSTRUCTION

Harnischfeger Corporation produced the *first* all-welded excavator early in 1935. Why? Because 20 years ago, Harnischfeger realized that all-welded construction on excavators gave features such as these to P&H users:

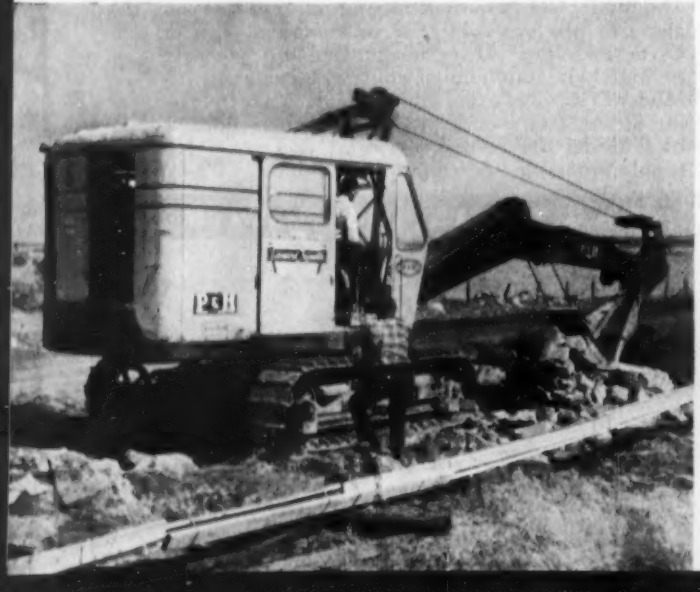
1. The strongest construction known . . . stronger per pound of weight than comparable cast construction.
2. The best suited material for each component part of the excavator! The manufacturer is able to select the right combination of alloy steels for a particular function.
3. The elimination of dead weight! Thru a liberal use of alloy steels, it's possible to build up strength exactly where it's needed most. Gone are beefed-up, power consuming castings.
4. Revolving frame, including side stands, is built entirely of rolled steels and welded as a rigid unit, permitting machining as a single unit to insure perfect alignment.

Thru the years, thousands of P&H owners have enjoyed these cost-cutting advantages on their jobs. And, today, *P&H buyers have the added benefits gained in two decades of experience and know-how in all-welded construction.* See your P&H dealer or write P&H Power Crane and Shovel Division, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

HARNISCHFEGER

the P&H *Line*

P&H 255-A trench hoe (¾-yd.) on ditching job in Quebec



255-A truck crane clears land for new road. Long Island, N. Y.

(Advertisement)

New Rotary Trowel enters field

"What we need is a really rugged trowel, one that can't get away from you and crack up", said one veteran concrete man when interviewed.

Because Stow Manufacturing Company, makers of concrete vibrators and screeds in Binghamton, New York, decided to make a Rotary Trowel, an exhaustive study was conducted to find out what concrete men wanted in a Rotary Trowel. Stow knew they were getting into a field where competitive manufacturers were well established, and that they had to come up with a machine that would be superior to any other on the market.

Thousands of dollars were put into the design and perfection of the Stow Roto-Trowel. The result: the G-34 Roto-Trowel; a rugged, safe, easy-to-handle machine that trowels smoothly.

Probably the most outstanding feature on the G-34 Roto-Trowel is the stationary guard ring, instead of the conventional rotating type. With the rotating type guard ring, the operator must be extremely careful whenever he works near walls and obstructions; if the ring should touch any object, it could wreck the trowel and injure the operator. With the Stow Roto-Trowel's strong stationary guard ring, the operator can trowel much closer to walls and obstructions with no fear of accidents.

Another feature, the squeeze-type dead-man control on the hand-grip, stops the trowel blades the instant the operator releases pressure; however, the engine continues to operate, eliminating the necessity of re-starting the engine. This is an important safety device, because it eliminates clutches, which sometimes become faulty and grab, causing serious accidents plus the expense of a new clutch.

THIS DEAD-MAN CONTROL on the wide cross-bar of the handle immediately stops the machine, but not the engine, when it is released.

STOW ROTO-TROWEL FINISHING A SUPERMARKET FLOOR. Before trowelling, a Stow screed was used to strike-off the surface. By screeding and using a 1" slump concrete, the concrete set up so fast, they were able to put the Roto-Trowel on the job only 1 hour after screeding.

The Roto-Trowel's dead-man control is fool-proof; it works by tightening an idler pulley against the belt drive. Releasing the lever loosens the belt, immediately stopping the rotating blades. With this type of drive, the operator can throttle the trowel down from 100 RPM to 25 RPM where special conditions require slow speed.

The Stow G-34 Roto-Trowel is powered by a 2½ HP gasoline engine which supplies ample power for even high slump concrete. The unit has an adjustable handle so the operator can set the height to his most comfortable operating position. This feature, plus the wider handle, makes the Roto-Trowel much easier to maneuver, regardless of the height of the operator.

On a construction job where one Stow Roto-Trowel was put in among competitive trowels, the contractor discovered that his trowel operators were actually arriving on the job early each day in order to use the Stow Roto-Trowel. They found it much easier to handle.

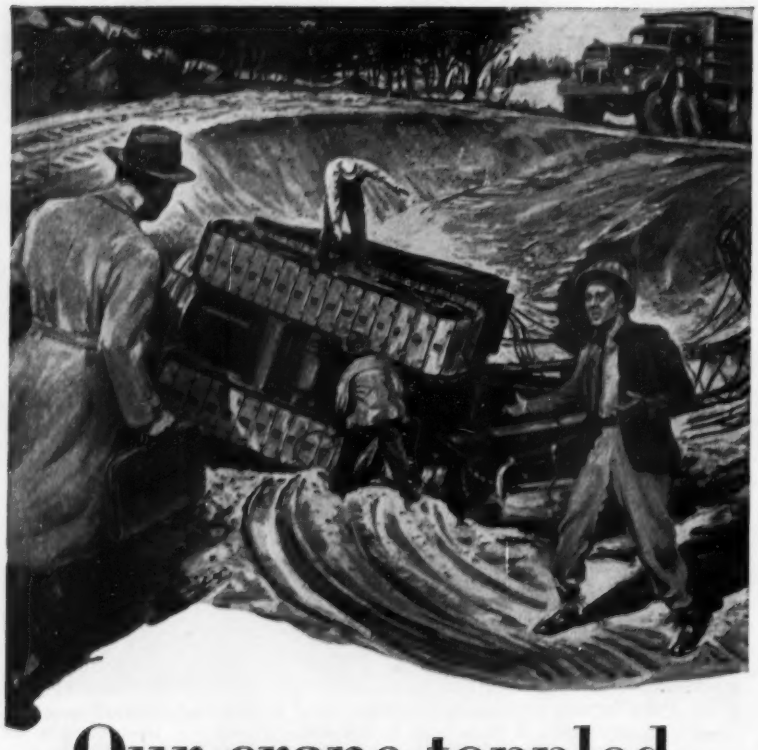
A hook mounted on top of the engine makes it easy to lift the Stow Roto-Trowel to higher levels. A knob on the handle controls blade pitch while the machine is running. All three blades fit into recessed slots to insure correct seating; each is secured by a hand-turned wing nut for quick changing. Float blades are 10x14 inches; finish blades are 6x14. Both blades are made of special wear-resistant steel and can be reversed for double life.

The G-34 Roto-Trowel, complete with a set of float and finish blades, weighs 143 lbs.; sells for $375.00 F.O.B., Binghamton.

A 34-inch electric trowel is also available with a 1½ HP motor.

Contact your nearest Stow Distributor for a demonstration, or write Stow Manufacturing Co., 284 Shear St., Binghamton, N. Y. Ask for Stow's complete catalog on Concrete Vibrators, Portable Concrete Grinders and Vibrating Screeds, and Rotary Trowels.

STOW **MANUFACTURING COMPANY**
284 Shear Street
Binghamton, New York
Originators of the Flexible Shaft



Our crane toppled...

but it wasn't off the job for long —thanks to Hartford service!

(Based on Company File #HM-54-2869)

We were going to dredge for a small dam at a private pond. The job shouldn't have given us any trouble.

I picked what looked like a good spot to start work. George, my crane operator for 15 years, drove the machine down the slight slope.

He locked his brakes and was changing gears when the banking gave way. The crane dipped onto one track and toppled over! Somehow, George managed to scramble out safely.

There was a phone in the gas station down the road, so we put in a quick call to our Hartford Agent. He had an adjuster on the scene promptly. As a result, we lost hardly any time in getting the crane hauled out, repaired and back to our dredging job.

The bills? Our costs for salvage, new parts and labor came to $3,062.67. Under our Contractors' Equipment policy, the Hartford Fire Insurance Company paid them all!

When one of your machines is knocked out of commission, *action* is what you want.

And Hartford acts fast! Gets a man out to you promptly. Helps you get your equipment back on the job in as short a time as possible.

Make sure *you'll* have Hartford help after an accident! Write us for details . . . and a free copy of "Your Machinery and its Actual Cash Value." Or call your Hartford Fire Insurance Company Agent or your insurance broker—*today*.

Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company
Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey . . . *Hartford 15, Connecticut*
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company . . . *Minneapolis 2, Minnesota*

Labor . . . Continued from page 144

in such areas continues to mount.

Any contractor who is interested in starting an apprentice-training program should know that there are agencies of government that can help show the way. Under federal law the Secretary of Labor was authorized to set up apprenticeship standards and promote the training of apprentices in apprenticeable crafts—those that require 4,000 hr or more to learn. This is the job of the Bureau of Apprenticeship.

The federal law is, in many states, supplemented by state apprentice laws under which State Apprentice Councils have been established. If your state has such a law, you can write to the State Apprentice Council for information and assistance in getting an approved program started. If your state doesn't have such a law write to the Bureau of Apprenticeship, U. S. Department of Labor, Washington 25, for the pamphlet "The National Apprenticeship Program" and other similar data.

In implementing the federal law, the Bureau of Apprenticeship has established certain minimum standards which must be met for an approved program. They are:

1. Minimum age for apprentices—16 years

2. A schedule of work processes to be learned on the job

3. A progressively increasing scale of wages so that apprentices average not less than 50% of the journeyman's rate for the entire training period

4. Related classroom work (minimum of 144 hours a year)

5. Review and registration of the apprentice program, containing also terms and conditions of employment and training by the Bureau of Apprenticeship or a similar state agency recognized by the federal Committee on Apprenticeship

6. Registration of apprentices by the federal Bureau of Apprenticeship or a recognized state agency

7. The program must be jointly established by employers and employees

8. Adequate instruction, supervision and records of attendance, etc.

Bear in mind that on federal construction, contractors are not allowed to employ apprentices unless

(Continued on page 152)

EATON AXLES

Proven Performance in Every Type and Size

The rugged housing used in famous Eaton 2-Speeds is also used for Eaton single-reduction and double-reduction axles—the three heads are interchangeable.

Behind every Eaton Axle there is almost a half-century of truck axle manufacturing experience. The advanced engineering and quality construction which have made Eaton 2-Speeds famous for stamina and low-cost hauling are also found in Eaton single-reduction, double-reduction, tandem drive axles, and front axles. In more than two million motor trucks, Eaton experience and engineering know-how are reflected in outstanding performance records, minimum hauling costs, and longer vehicle life.

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

HAULING FOR CONTRACTORS IN OHIO...

"NYLON CORDS CUT OUR ROAD D

says EDGAR PITZER,

Fleet Supt., Hilltop Building Materials, Inc., Cincinnati, Ohio

"We haul ready-mixed concrete and other building materials averaging a gross weight of 20 tons. And delivering concrete we almost always travel at maximum load. We regard concrete as a semi-perishable commodity that must be delivered on time to meet rigid mixing-pouring schedules. That means we just can't afford to have road delays.

"Two years ago we started using nylon cord tires. On rugged rock and gravel conditions at building sites, sidewall strength is particularly important. Our records show nylons are standing up fine in spite of this brutal service. Even when rubber is scuffed off to expose the cords themselves, nylon tires hold up till the tire wall can be repaired. Nylons are giving us 30,000 to

YOU'LL FIND NYLON IN PASSENGER-CAR TIRES, TOO! Shock-absorbing nylon cords mean extra protection against blowouts . . . greater safety on any road.

DELAYS DUE TO TIRE TROUBLE 75%"

35,000 miles from original tread, and we expect 20,000 to 25,000 miles from each recap."

For ten years Du Pont and leading tire manufacturers have been working together to perfect nylon cord truck tires. Now actual road experience proves nylon to be the best protection yet against tire failure. Truck users' reports show nylon cord tires mean fewer road delays, more mileage, more recaps —lower cost per mile.

Nylon has greater tensile strength, flex and abrasion resistance than any other cord used in tires. Nylon virtually ends cord ruptures caused by bruise breaks. Moisture seeping through cuts doesn't damage nylon. Nylon can take the hottest road temperatures you'll ever encounter in normal operations.

Prove to yourself that nylon cord truck tires give substantially lower cost per mile. Ask your dealer about nylon cord truck tires today. (Du Pont makes nylon yarns, does not produce tires.)

DU PONT NYLON
FOR TIRE CORD

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

FREE BOOKLET on nylon tires—write for your copy. Textile Fibers Dept., Room 11506, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

Labor . . .
Continued from page 148

they are enrolled in a recognized and approved apprentice training program.

If you are in an area that has no apprentice training, now is the time to discuss such a program with the unions that furnish men to your jobs. If you get no cooperation there, although you generally will, remember that all the international building trades unions are very much interested in these programs. They can help by educating the local officials.

Negotiations

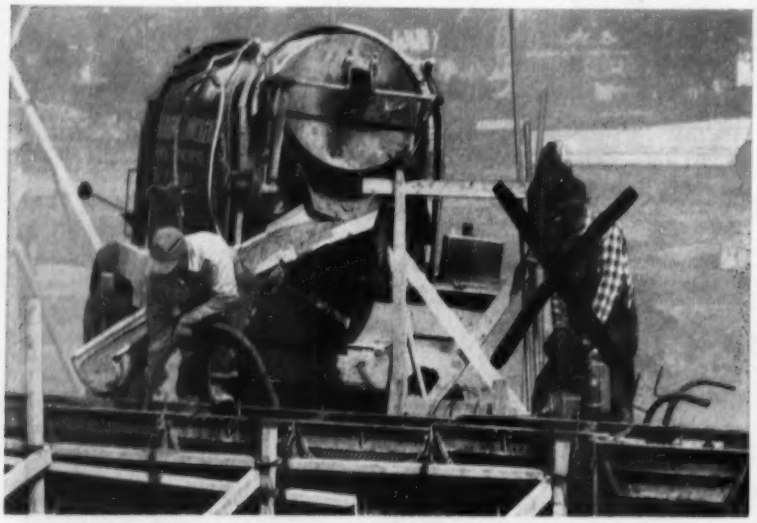
Reports filter in of settlements throughout the country of contract terms for the coming year. These are so spotty that no so-called "national pattern" can be said to have been set.

For example, bricklayers in Canton, Ohio, have settled with their employers for a 2½c wage increase (making their rate $3.30 per hr); carpenters, laborers, engineers and teamsters in Tulsa, have agreed with their employers on a 5c hourly boost; major trades in Syracuse, N. Y. have settled contract negotiations with the Building Trades Employers for a 10c per hr increase. This brings carpenters to $2.92, bricklayers to $3.30, laborers to $2.15, engineers (top rate) to $3.30. All these trades have a 7½c welfare fund, which does not change.

On the other hand, leading trades in Rochester, N. Y. (carpenters, masons, plumbers, laborers, electricians, engineers) are making a strong bid for a reduction of the work week from 40 hr to 35 with no loss of pay. The negotiating contractors are just as strongly opposing such a move. Indications are that there will be no reduction this year. (New York City has had a 35-hr week for many years for laborers and mechanics employed on building construction.) A similar move for the 35-hr week is being made by the cement workers in 46 northern California counties who are also asking the AGC negotiating committee for a 3% vacation fund and a 2½c increase in the welfare fund.

A Guaranteed Wage?

In some current negotiations, the guaranteed annual wage takes the form of demands for "vacation funds" which are actually intended to cover periods of unemployment. Here's how one such plan is supposed to work. The contractor purchases books of stamps from the depository—usually a bank, not the union. The stamps are in various denominations so that the correct amount can be issued to the individual employee each week with his pay. Each man has a booklet with spaces for each denomination of stamps. The longer a man works, the more books he fills, the more money is in the depository earmarked for him. If he should run into a period of unemployment, he just goes to the bank and cashes a book. Such funds are not new, but are becoming more common as they seem, to union negotiators, to be the answer for the construction industry to the riddle of the guaranteed annual wage. Unions also argue that these funds, with unemployment compensation added, make it possible for men to take care of their families during long periods of unemployment. There is one catch to this, however, as no method has been devised to control withdrawals to periods of real need. With no restrictions men can cash their books for any purpose and still face the problem of unemployment.



NEW MASTER "1-MAN" VIBRATOR CUTS VIBRATING COSTS IN HALF

Only 25 lbs. Easy to handle.

It weighs 25 pounds! It's all in one piece! It plugs into any regular 115 Volt AC or DC electric line . . . and with no heavy engine or motor to drag around, one man handles it easily.

The motor is sealed in the vibrating head, so there's no flexible shaft to get out of whack; no oiling or greasing problems; no kinking troubles.

No field maintenance is necessary: when motor head needs attention, snap it off and snap on a spare.

The vibration actually penetrates farther and leaves fewer voids in the concrete than old-style vibrators.

The price is *low*. The design has eliminated so much cost, and no special power source is required, but the big saving comes in use. Write for folder or ask your Master distributor for a free demonstration. You'll see exactly how the Master "1-Man" can cut your vibrating costs *at least* 50%.

MASTER VIBRATOR COMPANY
156 Stanley Ave., Dayton 1, Ohio

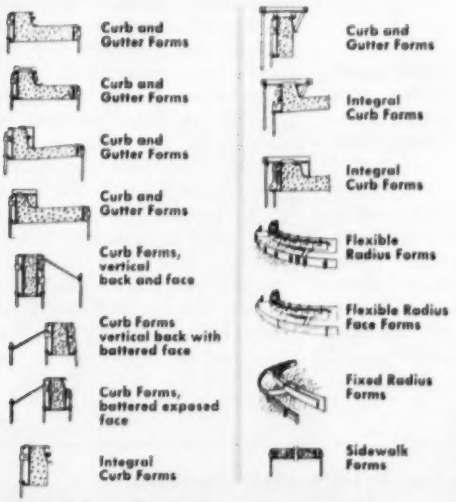
MASTER

Curb Service

THAT PAYS OFF IN EXTRA PROFIT!

The BLAW-KNOX *"Complete Package"* of STEEL UNIVERSAL STREET FORMS

meet *any* cross section requirements and every construction specification



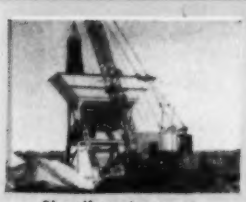
Here's how you *save* money to *make* money on curb, gutter and sidewalk jobs! Blaw-Knox Steel Forms are *standardized* for interchangeability . . . use them in any combination to fit your job. You can use them over and over to save on costly material and expensive carpentry, especially for curved shapes. Blaw-Knox Forms are easy to set, strip and transport, and there's practically no maintenance!

Ask your Blaw-Knox distributor to explain all the other ways a "Complete Package" of forms will do a better job, faster, and at half the cost!

BLAW-KNOX

BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION
Pittsburgh 38, Pa.
Offices in Principal Cities

See your BLAW-KNOX distributor . . . ask about the "Complete Package" of concrete paving equipment



Blaw-Knox Aggregate Batching Plant

MultiFoote 34E DuoMix Concrete Paver

Blaw-Knox Finishing Machine and Concrete Spreader

Blaw-Knox Bulk Cement Batching Plant

Extra components add more flexibility to standard duplex plant. That's how . . .

Tailored Aggregate Plant Meets Tough Specs

SPECIFICATIONS FOR AGGREGATES on important work are getting tighter all the time—and those on a current runway modernization project at Castle Air Force Base near Merced, Calif., are no exception (see table below). Fredericksen & Kasler, Sacramento contractors, knew this when they undertook to prepare 330,000 tons of high-grade gravel aggregate for the job. But by adding auxiliary units to their basic portable crushing plant, and with some job-made alterations, the contractors not only are meeting the tough specs but also have increased the plant's output.

Basic equipment is a Pioneer 46-VE duplex crushing and screening plant, which carries a 1036 jaw crusher and 40x22 rolls. Fully portable, the rig was moved from a previous highway setup to the Castle job to turn out 225,000 tons of granular base mat material and 105,000 tons of aggregate for bituminous pavement.

Two things were done immediately to give the Corps of Engineers the fractured fraction their specifications demanded. A Pioneer 4309 triple 40x22 roll crusher, independently powered by Caterpillar D17000 diesel engine, was set in the line between the duplex plant's jaw crusher and rolls. And a separating device was rigged up to split whatever portion of the jaw crusher throughs was desired, routing all or part of that product to the auxiliary triple rolls. A proper percentage of the fraction was routed as necessary to the regular roll crusher on the 46-VE.

A few years ago, Plant Superintendent George Bell noted that the Pioneer plant, taking in raw material over a bottom-deck screen,

Aggregate for Granular Base Mat

Sieve Size	Base Course* % Passing	Leveling Course* % passing
2 in.	100	—
1½ in.	70-100	100
1 in.	55-85	70-100
¾ in.	50-80	60-90
⅜ in.	40-70	45-75
No. 4	30-60	30-60
No. 10	20-50	20-50
No. 40	10-30	10-30
No. 200	5-15	5-15

*At least 50% of material by weight to be fractured particles, (two-surface-minimum crushed fragments).

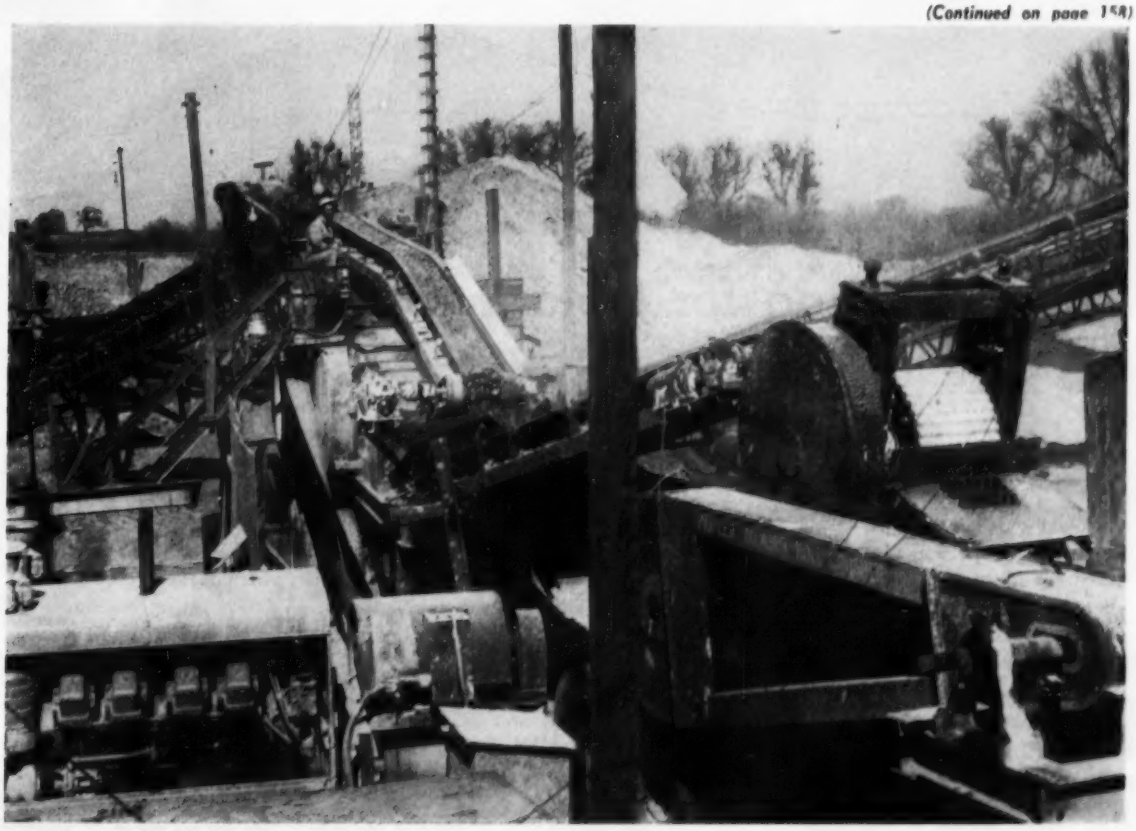
Aggregate for Asphaltic Plant Mix

Sieve Size	Binder Course** % Passing	Binder Course** Allowable ± Variation %	Surface Course** % Passing	Surface Course** Allowable ± Variation %
¾ in.	100	—	100	—
½ in.	89	5	94	4
⅜ in.	69	5	82	4
No. 4	46	5	63	4
No. 10	35	4	48	3
No. 20	28	4	39	3
No. 40	17	4	28	3
No. 80	8	4	13	3
No. 200	5	1½	4.5	1½

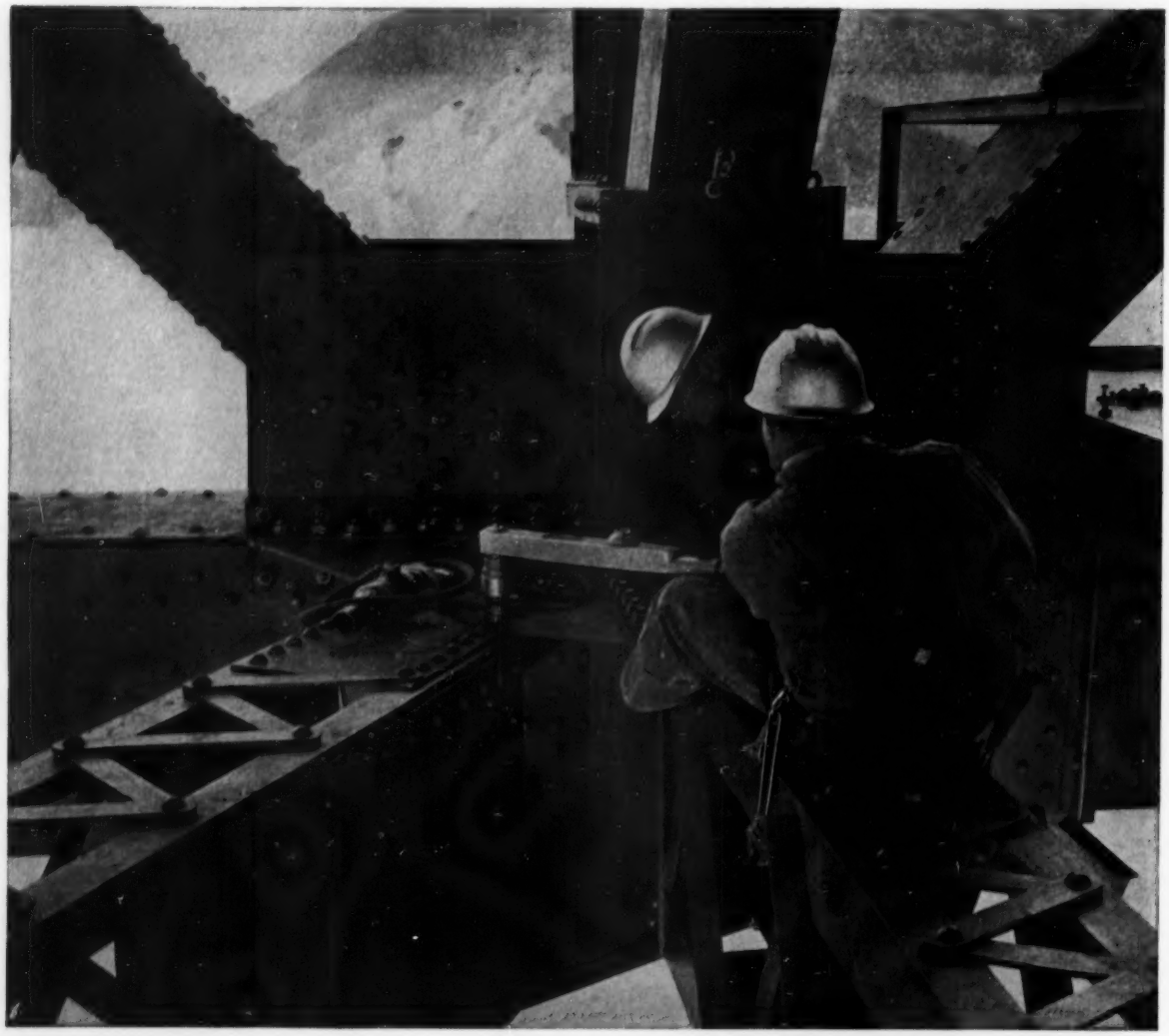
**Minimum of 75% by weight to be crushed material. On plus No. 10 portion, at least two faces to be fractured by crushing. Rock to have maximum loss of 40 in Los Angeles Rattler test.

RAW MATERIAL is bulldozed over apron feeder to start it on way through Pioneer 46VE crushing and screening plant. Conveyor feeds it to bottom deck screen that separates out sand meeting specifications so it does not pass needlessly through crushing system. Sand goes to scrubber over belt (left) whose drive sprockets were reversed by contractor to increase speed considerably.

(Continued on page 158)



TRIPLE ROLL CRUSHER supplements duplex plant's regular rolls to add to production by reducing all or part of the material passed first through the plant's jaw crusher. An adjustable splitting device determines what proportion is routed to added rolls.



Bracing for Golden Gate Bridge Fastened with High-Strength Bolts

Taken hundreds of feet above the waters of the Golden Gate, this photograph shows workers using a torque wrench to check the applied tension on one of the Bethlehem High-Strength Bolts connecting a gusset plate to a diagonal in the new bottom lateral system for the Golden Gate Bridge.

This new lateral system, extending the full length of the bridge, ties in with the east and west bottom chords to increase the torsional stiffness of the structure. It was installed by Judson Pacific-Murphy Corporation, and consists of 4700 tons of fabricated structural members, joined to the original steelwork with 190 tons of Bethlehem High-Strength Bolts.

High-strength bolts were specified by the design engineers because of their ease of installation. With no unduly bulky equipment being required, the work could proceed smoothly, even during periods of high winds, resulting in a cost saving through reduced erection time.

Bethlehem High-Strength Bolts are readily installed. With two hardened washers used on each bolt—one under the head, the other under the nut—the bolt head is grasped with a holding wrench, where necessary, while the nut is tightened to predetermined tension with a calibrated pneumatic impact wrench. It's as easy as that!

We have an interesting illustrated booklet, "High-Strength Bolting for Structural Joints." Send for a copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corp. Export Distributor: Bethlehem Steel Export Corp.

BETHLEHEM STEEL

BETHLEHEM STEEL

The Engineer's Report

CASE HISTORY

PRODUCT *RPM Delo Oils*

FIRM *Bagdad Copper Corp., Bagdad, Arizona*

Biggest truck in the world uses RPM DELO Oil!

246,000 POUNDS TOTAL LOAD, 48 tons of truck and 75 tons load, are hauled out of the Bagdad Copper Corp.'s ore pit at Bagdad, Arizona, by the two 350 h.p. supercharged diesels in this unit. RPM DELO Special Lubricating Oil is used in the engines as specified by Mr. Ernest Dickie, General Manager of Bagdad, on the basis of his years of experience with RPM DELO Oils in many other heavy-duty engines.

The big truck, described as the largest in the world, was designed by Mr. Dickie and engineers of Dart Truck Co., builders. Power is transmitted through 3-stage torque converters. All controls are powered.

FREE FOLDER tells you about all the RPM DELO Oils and how they meet every heavy-duty engine condition. Write or call for it today.

FOR MORE INFORMATION about petroleum products of any kind or the name of your nearest distributor, write or call any of the companies listed below.

RPM DELO LUBRICATING OILS

TRADEMARK "RPM DELO" REG. U. S. PAT. OFF.

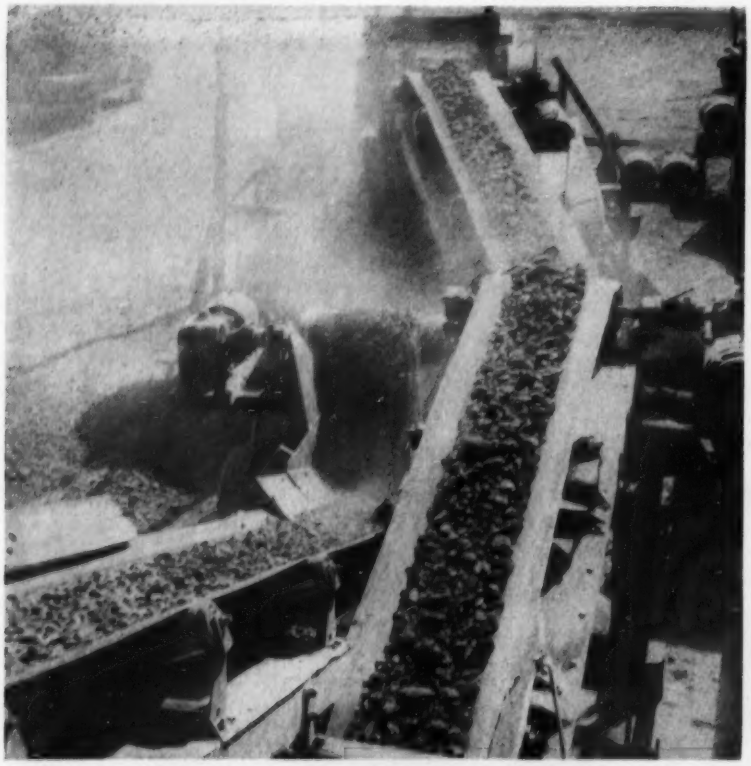
How RPM DELO Oils reduce wear, corrosion, oxidation in all heavy-duty engines

A. Contain special additives that provide metal-adhesion qualities...protect parts whether hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring sticking. Detergent keeps parts clean...helps prevent piston scuffing.

C. Special compounds stop corrosion of any bearing metal and foaming in crankcase.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado



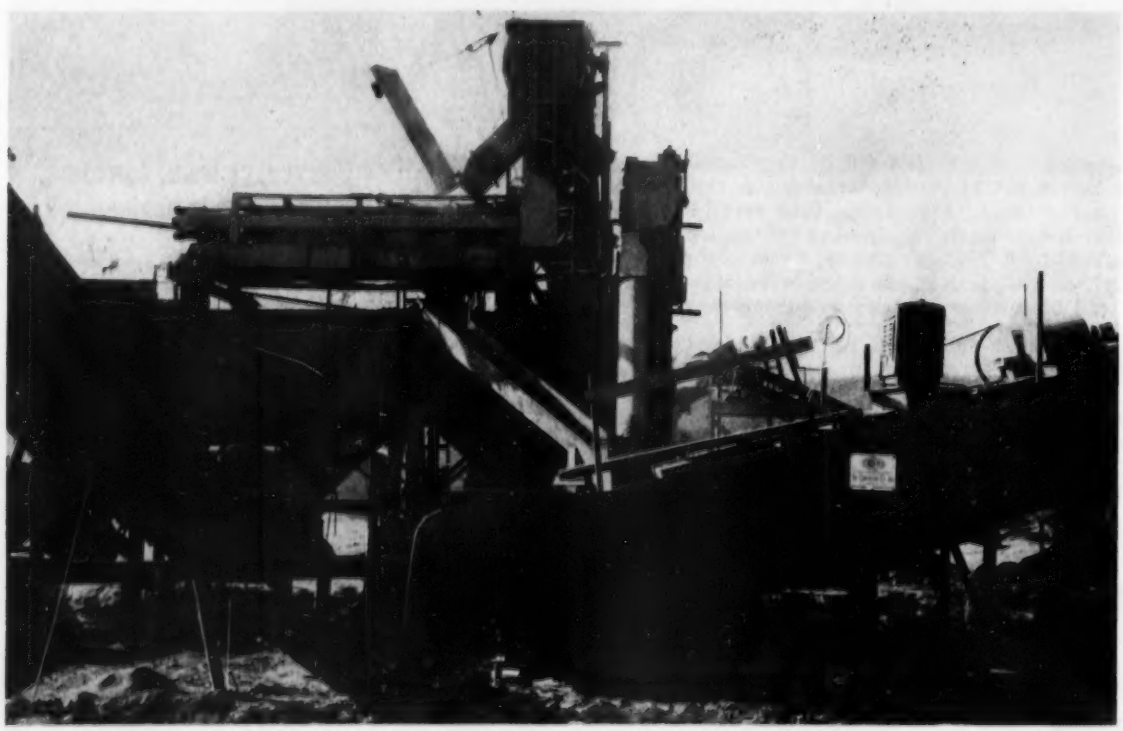
JAW-CRUSHED MATERIAL goes to Pioneer 40x22 triple roll unit over right-hand conveyors, and processed material pours back on left, to lessen work on duplex plant's secondary.

could remove the sand fraction automatically at high speed without carrying the material needlessly through the crushers. To step up over-all production to its ultimate, he knew he'd have to take that sand away from the plant fast. Bell isn't afraid to try anything, so he reversed the sprockets on the sand-stacker conveyor, hooking the big side of the sprocket to the driving motor. While the result is not too far short of fabulous, the original belt has hung together all this time and is still performing well at Castle. Here, where the sand fraction is a definite problem, the ability of the bottom-deck screen to separate that portion quickly and get it out of the way has been a definite advantage.

More Field Changes

Another of Bell's field inventions is a three-way splitter chute. It takes the finished product at high speed and, by various gates, routes the material into auxiliary surge bins. The problem arose originally on a highway job where hauling characteristics were such that extra surge capacity was needed. After Bell built an original single-bin

(Continued on page 161)



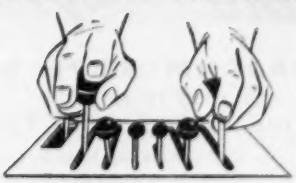
AUXILIARY SURGE BINS receive plant output via three-way splitter chute devised by superintendent. Chutes route material either direct to bins or, as here, to horizontal shaker sizing and washing screen atop them. When crusher-run material is desired, screen is rolled out of way on elevated rails. At right is sand scrubber that removes dirt and light material from fines.

K-580 SHOVEL MOVES ROCK FASTER—operator works with greater speed and safety because of greater "live" weight built into every Link-Belt Speeder. All-welded, stress relieved construction gives greater strength per pound. Alloy cast-iron clutch shells assure superior friction, longer lining life. Independent rapid boom hoist has power control up *and* down.

Now every Link-Belt Speeder shovel-crane has *Speed-o-Matic*®

—no lag, no jerk, no strain—

IT'S FULL POWER HYDRAULIC CONTROL



Today Speed-o-Matic controls are *standard equipment* on every size rig in the entire Link-Belt Speeder line! Full power hydraulic control is your key to 25% extra production . . . more consistent profits in the ½ to 3-yard, 6 to 60-ton work range. Here's why:

- REDUCED OPERATOR FATIGUE—fingers, instead of muscles, put full power to work.
- SMOOTHER CYCLES—complete cycle is one fluid motion.
- MORE ACCURATE CONTROL—operator always safely *feels the load.*
- REDUCED CLUTCH ADJUSTMENTS—clutch piston is self-compensating for normal lining wear and heat expansion.
- 150 WORKING PARTS ELIMINATED—maintenance costs cut.

Join thousands of alert owners who are making more money with Link-Belt Speeders. Contact your Link-Belt Speeder distributor for details. LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa.

19,781

LINK-BELT SPEEDER

Builders of a complete line of crawler and rubber-tired shovel-cranes

MORE SERVICE — LONGER LIFE

YELLOW STRAND

FLATTENED STRAND WIRE ROPE

If you have a problem spot for wire rope, where sheaves, drums or the rope itself is wearing too fast, solve it with Yellow Strand Flattened Strand! Yellow Strand Flattened Strand is formed of strands laid up in a triangular form to obtain a smoother outer surface. You get 10% greater metallic area, a corresponding increase in strength, plus a compactness unobtainable in round strand construction. It is not uncommon to get twice the service—and even more! This means you also save much of the time lost in frequent rope changes. Call your Broderick & Bascom distributor today or write us direct.

Compare Yellow Strand Flattened Strand with ordinary (at right) wire rope. In Flattened Strand you have twelve contact points, greater bearing area, smoother surface, less wear. Result: longer service, lower final cost!

Yellow Strand

BRODERICK & BASCOM ROPE CO.

4203 UNION BLVD. • ST. LOUIS 15, MO.

Manufacturers of Wire Rope for 79 Years

655 Edmunds St., Seattle 8, Wash.
1518 N. W. Marshall St., Portland 9, Ore.
44 Potrero Ave., San Francisco 3, Calif.
117 Jefferson Highway, New Orleans, La.
32-30 43rd Ave., Long Island City 1, N. Y.
1330 W. Fulton St., Chicago 7, Ill.
2441 Hunter St., Los Angeles 21, Calif.
9350 Market St. Road, Houston 15, Texas

FINISHED AGGREGATE from surge bins and scrubber is stacked by conveyor and bulldozed over feeder tunnel to hot-mix plant.

unit, two more Pioneer 25-yd surge hoppers were added to give desirable surge capacity in any fluctuating haul picture.

On the Castle AFB setup, a steel-rail framework has been mounted over the first two bins to carry a secondary set of vibrating screens. Its single deck is arranged to drop three graded sizes of material, one into each hopper. Short stacker conveyors at the bottom of each of these bins pile material near by.

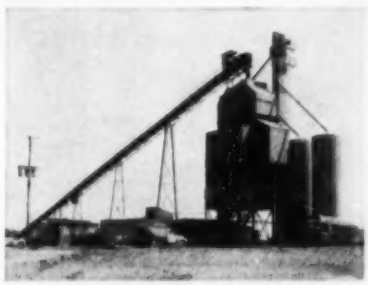
The last refinement which Fredericksen & Kasler added to their portable crusher was a Conveyco sand scrubber and a set of shaker screens through which all material could be washed. This was considered necessary by Corps of Engineers technicians because the percentage of decantable dirt and light material ran slightly high in the raw feed. In any event, the Pioneer portable plant and its modest auxiliary components turn out an excellent finished product, both for base course and mineral aggregate use.

Fast Material Routing

Raw material to feed the plant comes from the Merced River bottom. It is a well-graded hard gravel, all rounded from considerable stream travel. This material is dug by a 2-yd Northwest dragline that loads three 18-yd Euclid trucks. At the aggregate plant, truck-dumped raw gravel is pushed to a feeder trap by a D8 tractor fitted with a U blade.

A Pioneer 4x4 apron-type feeder below pulls material out of the trap and places it on a 50-ft inclined conveyor. The conveyor feeds the Pioneer duplex plant's bottom deck, which quickly separates out all sand whose size meets specifications. Thus, material already acceptable is not routed needlessly through the plant's crushing system.

(Continued on next page)



1. Central plant produces 3 types of mixes

2. Dumpcretes haul 4 yds. to paving site

3. Same truck with different mix for bridge

4. Access road widening gets this 4 yd. load

Dumpcretes haul concrete for paving, widening, bridges on Ohio Turnpike

D. W. Winkelman's simplified concrete operation on the Ohio Turnpike has created a stir of interest among paving contractors. With central-mixing and Dumpcretes he produced and hauled concrete for paving a 10-mile section . . . for widening access roads . . . and for bridges, retaining walls and other structures. This method allowed pours on many of these jobs to be made at the same time with concrete produced by a single plant . . . and eliminated pavers, water trucks and the men to run them. The same method cuts costs on small jobs, too. Write for job reports.

MAXON DUMPCRETE

Fastest from plant to pour

Send Me ☐ Concrete for Paving and Structures on Ohio Turnpike ☐ Job Reports on Low Cost Non-Agitating Hauling of Concrete

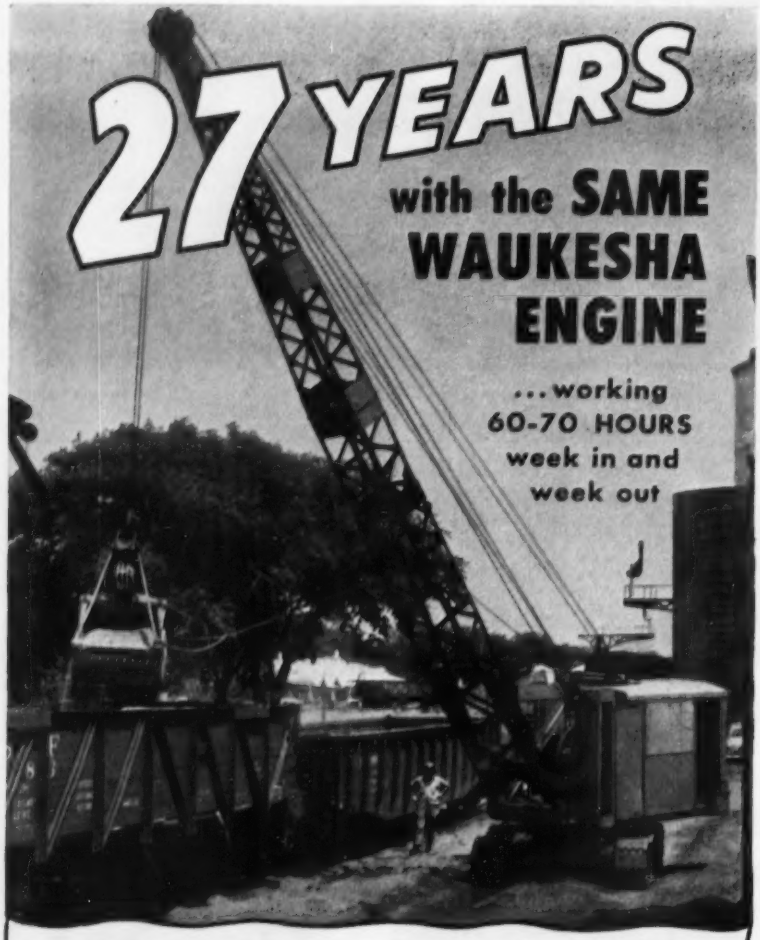
Name _____

Firm _____

Street _____

City _____

Manufacturing Division, Maxon Construction Co., Inc., 707 Talbott Building, Dayton 2, Ohio



Unloading 32 railway cars of sand in 9 hours! That takes a fast operator, a good crane, and speedy, responsive, reliable power.

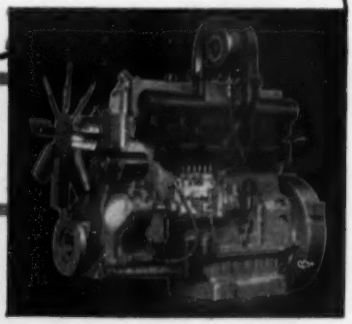
Contractors L. V. Hites and M. W. Martin of Topeka, Kansas, have such a combination.

Operator, Earl Walker, has been speeding up construction jobs with this Waukesha Engine powered American Crane ever since 1928.

That's 27 years' straight—working 60 to 70 hours every week. The Waukesha JL (Serial G-181) is the crane's original engine. It's had several overhauls, of course. Once it got a set of second-hand blocks (when new ones couldn't be had). Sure they offer Earl new cranes. He likes this crane and its Waukesha.

...and modern Waukesha Engines have even greater stamina and reliability

GAS • GASOLINE • NORMAL or TURBOCHARGED DIESELS
—up to 1135 horsepower for every industrial service



Modern 1197 cu. in. Waukesha Turbocharged Diesel—Model WAKDBS—over 350 hp—used in many makes of cranes, shovels and heavy trucks. Send for bulletin.

279

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
NEW YORK • TULSA • LOS ANGELES

TAILORED AGGREGATE PLANT . . .
Continued

For production of plant-mix aggregate, the bottom deck is fitted with a No. 4 by 3-in. slotted screen, which has proved to be unusually efficient in removing this already acceptable material. The screen is unnecessary in producing crusher-run, sub-base material.

The sand fraction passing through the bottom deck screen goes direct to a sand scrubber. All oversize retained on the screen passes through the plant's 10x36 jaw crusher. As a rule, this crusher merely reduces the larger particles so they will pass easily through the tremendous roll crushing capacity that Fredericksen & Kasler have in the plant.

Gate Divides Flow

Throughs from the jaw crusher are controlled by an adjustable gate, which permits the product to be divided between the Pioneer 46-VE's roll crusher and the separate triple roll crusher unit. In any event, the product from both rolls is arranged in closed circuit with the upper deck screening system on the duplex plant. Rock sized by this system passes immediately over stacker conveyor belts to a secondary single-deck system of screens. Here the product is washed by a water jet as it receives its final sizing. Material retained on the 46-VE's screen deck is, of course, rerouted through the roll crushers in closed circuit until it meets sizing requirements.

On the final screen deck, where the product is washed, crusher dust and the remaining sand fraction drop through to join sand fines which already have entered the scrubber. This entire product then is washed and pulled out by the scrubber's screws. It is stacked, like the other sizes, by a short conveyor run.

Processed aggregates for the asphaltic mix are cleaned away from time to time by a Caterpillar U-type dozer, which piles each size over a feeder tunnel at the hot plant near by. The final gradation control then is made for binder and surface courses by altering the feed from each size of material over the tunnels. The last screening refinement, of course, is made over the sizing equipment of the hot plant itself.

For sub-base material, crusher-run product is dumped direct to the three 25-yd Pioneer auxiliary

(Continued on page 164)

The relief valve on a full-flow filter serves as a safety factor, pure and simple. If the filter element clogs, the valve opens so that the bearings will not have to run without any lubrication at all.

But . . . don't let this safety function of the relief valve lead you to think you can get along with substitute filter elements that have less than the requisite capacity for your diesel's lube oil system. Every time the relief valve opens, dangerous, abrasive-laden oil pours into your engine. Sure, it's better than *no* oil, but it doesn't take much of it to start serious bearing wear.

Your International-Harvester dealer-distributor knows that inadequate filtering can ruin precision parts in a matter of hours. That's why he makes a point of giving you only manufacturer-approved replacement filter elements built to I-H's exacting engineering standards by Purolator.

WARNING TO DIESEL USERS:

pay attention to your full-flow filter element refills

International UD-24 and UD-18 diesel engines power a 30-inch rock pulverizer.

PUROLATOR PRODUCTS, INC., Rahway, N. J. and Toronto, Ontario, Canada

GRAVEL PIT is Merced River bottom, from which Northwest 2-yd dragline digs raw material and loads it into 18-yd Euclid trucks for trip to aggregate plant. There it will be processed into excellent product meeting tough Corps of Engineers specifications.

surge bins. From these it is hauled 8 mi to the air base by a fleet of 50 Schonrock and Cook semi-trailers with GMC tractors, each carrying 40 tons per trip.

Another Fast Move

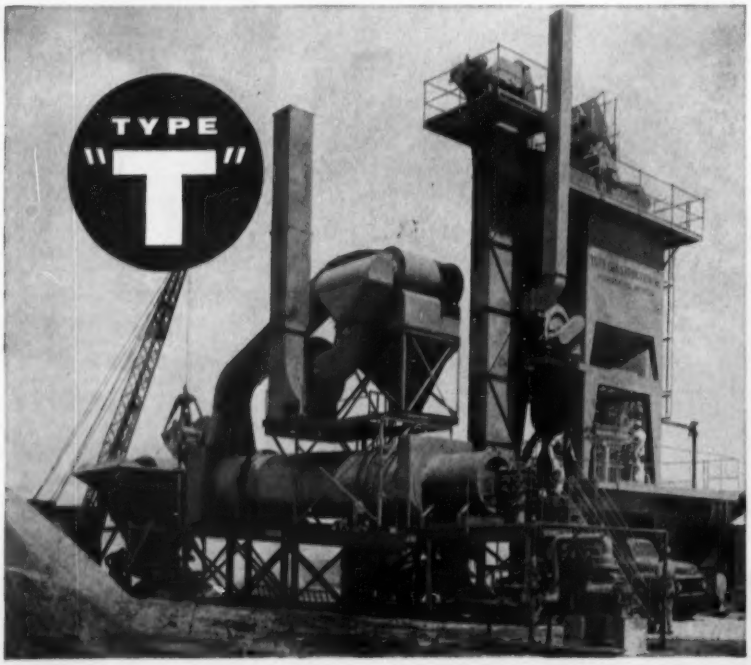
Fredericksen & Kasler's big gravel processing job is part of a $4,100,000 joint venture with Peter Kiewit Sons' Co. When the last of the aggregate is turned out in mid-summer, F&K expect to move their equipment in a matter of about two days from Merced to Mojave, where a similar job is brewing at Edwards Air Force Base. According to C. E. Kasler of the contracting organization, the move should be a quick and speedy one, with full confidence on his part that whatever specifications are required at Edwards will be met just as fast and efficiently as they were at Castle.

Completely New

IN DESIGN AND ENGINEERING

• The new H & B Type "T" batch mix asphalt plant is not a modified or "change over" version of an old model, but is *completely new* in design and engineering—from the ground up. Basic changes include: all-welded plate construction, which provides greater strength and resistance to vibration; new type Deister flat screen which provides greater screening capacity and is fully enclosed to retain dust and heat; internal self-contained over-flows which eliminate loose pieces to move or erect; self-contained, relocated dust bin, which eliminates the screw conveyor normally used to feed dust into aggregate weight box; and an individual trunnion roll drive on the dryer, which eliminates vibration and reduces maintenance costs.

Type "T" plants are available in choice of power and in four different capacities from 60 to 180 tons per hour. Write for Bulletin T-55.



HETHERINGTON & BERNER INC., *Engineers—Manufacturers*
735 Kentucky Avenue Indianapolis 7, Indiana

HERE'S PROOF THAT A-W GRADERS WITH ALL-WHEEL DRIVE HAVE 30% MORE POWER AT THE BLADE

To calculate Power-at-the-Blade, it is necessary to determine (1) skid pull due to traction and (2) maximum rim pull due to engine; using the formulas at the right, which are those used by manufacturers of tires and farm tractors.

The *effective* Power-at-the-Blade will be the *lesser* of the two figures. If you have more power than is necessary, and insufficient weight on driving wheels, you will slip the wheels, making SKID PULL the *limiting factor*. If you have insufficient power to slip the wheels, RIM PULL due to engine will be the *limiting factor*.

SKID PULL (DUE TO TRACTION)

$SKID\ PULL = W \times f$

W = WEIGHT ON DRIVERS

f = FRICTION COEFFICIENT BETWEEN TIRES AND GROUND

MAXIMUM RIM PULL (DUE TO ENGINE)

$RIM\ PULL = \frac{T \times 12 \times R}{Y}$

T = ENGINE TORQUE AT PEAK (INTERMITTENT RATING)

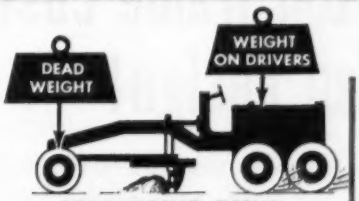
R = TOTAL RATIO, ENGINE TO REAR WHEELS

Y = LOADED RADIUS OF TIRE (INCHES)

EFFECTIVE POWER AT THE BLADE WILL BE THE LESSER OF THE ABOVE TWO FIGURES

Working in average dirt in first or second gear, all graders have more than enough weight to spin their drivers; therefore Skid Pull is the limiting factor, and the measure of comparative performance. The Austin-Western Power Grader, with its exclusive All-Wheel Drive, has 30 per cent more weight on driving wheels than any other grader; consequently moves 30 per cent more material . . . it's as simple and inescapable as that.

HERE'S WHY A-W GRADERS DELIVER MAXIMUM POWER



REAR DRIVE ONLY

No grader with a dead front end can possibly deliver maximum power at the blade. Weight carried on the idling front wheels of the conventional tandem-drive grader is *dead* weight, contributing nothing to traction—*lazy* weight, consuming power to no purpose. Every pound of weight not carried on a driving wheel *handicaps your horsepower.*

ALL-WHEEL DRIVE

On the Austin-Western Power Grader there are no idling front wheels—no dead front end to consume power and decrease efficiency. Every pound of weight rides on a driving wheel. Every pound is working weight—contributing 100 per cent to traction, utilizing the torque of the engine to best advantage, delivering maximum power where it counts—*at the blade.*

Austin-Western

Power Graders · Motor Sweepers

Road Rollers · Hydraulic Cranes

BALDWIN BLH LIMA-HAMILTON

Construction Equipment Division

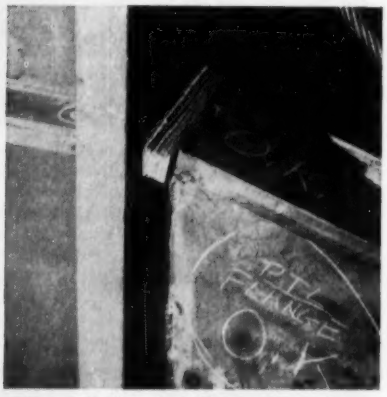
Manufactured by

AUSTIN-WESTERN COMPANY

Subsidiary of Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

Architect's drawing of the 25-story skyscraper made possible by ingenious use of welded design.



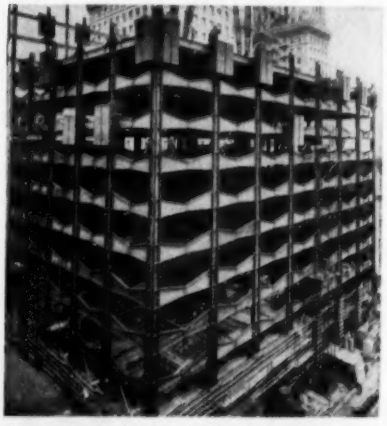
Close-up of finished weld between beam flange and column. "Fleetweld 5" and "LH-70" were used throughout the job.

Only $304 per ton frame cost with welded design!

THIS 25-story San Francisco skyscraper, with a 5,300-ton steel frame, has been erected for a cost of only $304 per ton. Erection of the building with welded design breaks a construction halt in San Francisco due to strict demands of the 1948 building code.

Lincoln engine-driven welders and electrodes were used to effect maximum economies possible with welded design of this 459,000 sq. ft. office building.

You can make similar welding savings by using welded construction. Get latest structural cost-cutting facts by writing on your letterhead to:



Erection of the Equitable Life Assurance building in San Francisco showing tapered continuously welded columns and "butterfly" spandrel beams which are welded to the columns.

THE LINCOLN ELECTRIC COMPANY

Dept. 2702 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

A MESSAGE TO AMERICAN INDUSTRY • FIFTH OF A SPECIAL SERIES

FINANCIAL AID TO HIGHER EDUCATION

Business Help for Our Colleges A Job for All Business Firms

IN recent months, individual business firms have announced the adoption of a variety of plans, both imposing and ingenious, for financial aid to higher education in the United States. In doing so, they have taken a lead in dealing with a problem of transcendent importance both to the business community and to our nation as a whole.

Previous editorials in this special series have shown that:

1. Our colleges and universities, and particularly the independent, privately endowed institutions, are in grave financial difficulties.
2. These difficulties promise to become much more acute in the years immediately ahead unless extraordinary steps are taken to relieve them.
3. A financially crippled system of higher education is a major national menace.

If, however, the business community is to play an adequate part in helping our colleges and universities financially, the plans adopted by business firms thus far constitute merely a beginning and a set of guide posts. What is required is a general movement on the part of business firms to go to the financial aid of higher education. Such a movement would involve a myriad of individual company plans which, in the nature of the case, cannot be expected to bring great renown or publicity to their sponsors.

Rescue Operation Is Feasible

For the business community as a whole it is feasible to make a major and possibly a decisive contribution to putting our colleges and universities back on their feet financially. One percent of business profits before taxes would do it. In 1954 business profits before taxes were about $35 billion. If one percent of these profits, or $350 million, were contributed to our independent, privately endowed colleges and universities it would enable these institutions (1) to increase the salaries they pay by $200 million a year, and (2) to provide $150 million more for modernization and maintenance of their establishments. In the opinion of competent authorities, this would put these institutions in relatively good working order financially, a process to which a matching grant of $50 million by the Ford Foundation for the improvement of faculty salaries will make a large contribution. It would add about one-fourth to their present annual outlay of about $1.4 billion.

Such a contribution from business would not meet the needs of the independent institutions for new buildings and equipment required to accommodate the great increase in college enrollment anticipated in the years immediately ahead. Neither would it relieve the financial problems of our tax-supported colleges and universities. As a group these institutions have fared better financially in recent years than the

independent institutions. But they also face grave financial problems, particularly in the provision of adequate faculty salaries. It would be far simpler, however, to solve the financial problems of the tax-supported institutions if the independent colleges and universities were back on their feet financially.

One Dollar Does Work of Two

The federal government exempts 5 percent of business profits from the tax imposed upon them if the 5 percent is devoted to religious, charitable or educational purposes. (Most profits are taxed 52 percent.) A contribution of one percent of business profits to higher educational institutions would exhaust only one-fifth of this allowance. It would bring to about two percent the total share of business profits going to both educational and charitable purposes.

In 1953, business firms contributed about $400 million, or slightly more than one percent of profits before taxes to educational and charitable purposes of all kinds. Of this total about $75 million went to educational institutions, mostly colleges and universities.

For some companies it is feasible to contribute more than the average contributed by business generally. Indeed, some companies not only utilize their full 5 percent of tax-deductible funds for charitable and educational purposes but go beyond it. For other companies in financial difficulties no contribution at all is possible.

If, however, those business firms for which it is financially feasible contributed one percent of their profits before taxes to our colleges and universities, the problem of adequate support for the crucially important business of higher education would be far along the way to successful solution. **In 1954 a contribution of one percent of their profits before taxes, or about $350 million, would have reduced business profits after taxes by only about half that amount. This would have meant a reduction of about $175 million, out of a total of about $17.8 billion of profits after taxes.**

Attractive plans to channel financial aid from business to higher education have been abundantly demonstrated recently. These plans, for the most part the creation of large corporations, have included not only a broad array of scholarship grants, but such ingenious arrangements as that by which a company matches with its funds the gifts its employees make to the colleges of which they are alumni.

A full array of these plans, some of which were discussed in an earlier editorial in this series, has been prepared by The Council for Financial Aid to Education (6 East 45th Street, New York City 17) and is available for the asking. Also, colleges and universities have established in most states and regions cooperative associations to help business help them. The Commision on Colleges and Industry (912 Kahn Building, Indianapolis 4, Indiana) distributes a directory of these associations. And, of course, the colleges themselves are always eager to discuss their financial problems with business people and suggest constructive solutions.

Only Small Start Made

The plans for business aid to education which have recently attracted national attention constitute the conspicuous sort of leadership which it is the privilege and opportunity of our great corporations to provide. But the job is too large to be handled by a small number of business firms, no matter how bold or ingenious their programs.

To put our colleges and universities back on a firm footing financially the help of the great rank and file of business corporations is required. All of them, large and small, have a crucial stake in seeing that this job is done. The future of America will be decisively shaped by what happens in and to our college classrooms.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

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IN AN ASPHALT PLANT

MADSEN Equipment that Serves ®

MADSEN gives you MORE!

(MUCH MORE)

MADSEN puts more in an asphalt plant (MORE FEATURES, MORE ADVANTAGES and MORE VALUE) . . . so that you can get more out of it (MORE PRODUCTION and MORE PROFITS). You will find the MADSEN Model 481 Asphalt Plant one of the greatest money-making plants ever offered to the American contractor. It was developed after many years of background work. Its list of features and advantages is truly outstanding in the industry. Shown below are a few of these features — compare them with those offered in any other asphalt plant and you will quickly see why your next asphalt plant should be the MADSEN Model 481.

SO WHY SETTLE FOR LESS?

MORE MADSEN Asphalt Pressure Injection System (Patented) pumps asphalt into the mill in 5 to 7 seconds . . . the fastest known method of getting every drop of asphalt into the mill.

MORE MADSEN Model 440 Twin-Shaft Pug Mill Mixer (Patent Pending) with improved mixing action, faster discharge and built-in oversize capacity. Has externally removable sectional liners, ground to precision fit at the factory for elimination of fitting in the field.

MORE Exclusive bin design (Patent Pending) eliminates segregation, provides uniform aggregate withdrawal and promotes improved aggregate distribution in the weighbox.

MORE In-built duct work to relieve pressure on mixer weighbox housings, bin, hot elevator and screen housings to draw off vapors, moisture and dust.

MORE Improved sampling mechanism for obtaining bin samples easier, quicker and with greater accuracy.

MORE Combination overflow and reject bin mounted on side of plant for ready accessibility.

MORE Finger-tip control of weighing and mixing levers centrally located for maximum efficiency.

MORE Safety equipment in the form of larger operating platforms, maintenance platforms and complete stairway and caged ladderway structures . . . all unit-built for ease of handling and assembly.

MORE Location of operator station on end of plant which provides unobstructed view of in-coming and out-going trucks . . . away from fumes and heat.

MORE In-built reserve capacity. You can purchase the MADSEN Model 481 Asphalt Plant as a 4000-lb. capacity unit and increase it to a 5000-lb. or 6000-lb. plant at a later date.

MADSEN

ASPHALT PLANTS and ASPHALT PLANT EQUIPMENT

BALDWIN LIMA HAMILTON BLH Construction Equipment Division

Manufactured by

MADSEN IRON WORKS, INC.

Subsidiary of Baldwin-Lima-Hamilton Corporation

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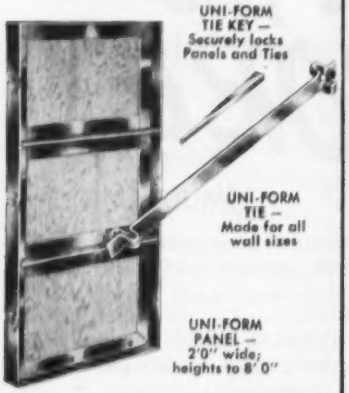
LA MIRADA, CALIF., U. S. A.

(Advertisement)

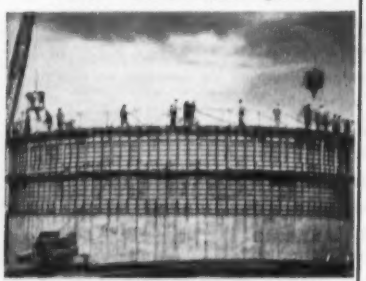
UNI-FORM
Concrete Forms

3 SIMPLE ELEMENTS FORM ANY CONCRETE STRUCTURE



UNI-FORM Concrete Forms are prefabricated steel-framed, plywood faced panels . . . ready to use when they reach the job.
UNI-FORM Ties and Keys lock and spread Panels into an automatically accurate form. No measuring — no guesswork. Completely versatile . . . they form straight, battered, circular, irregular or curved walls at lowest all around cost.

Rented . . . Sold . . .
Rented With Purchase Option



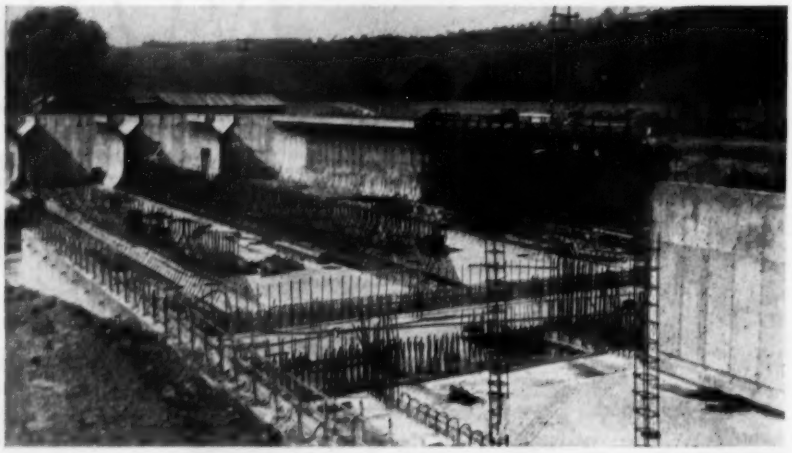
HIGH SPEED CIRCULAR WALL FORMING

UNI-FORMS provide faster, simpler and easier circular wall forming . . . one side alignment and bracing . . . absolute control of concrete, and safer, cleaner working areas.

Write for the UNI-FORM Catalog and complete details

UNIVERSAL FORM CLAMP CO.
1238 N Kostner Ave
Chicago 51, Illinois

Unique Prefab Form System Speeds Sewage Plant "Y" Wall Construction



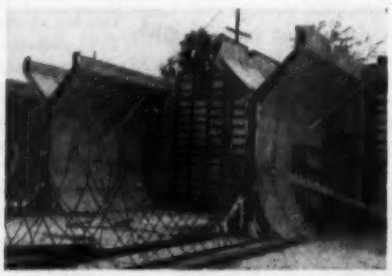
MECHANIZED FORMING with new "Y" wall trusses and UNI-FORM Panels speeds construction, saves labor and material

Field reports on a new system for forming "Y" walls in aeration tanks and settling basins indicate very satisfactory operation and important labor and material saving advantages for the system.

Developed by the Universal Form Clamp Co., Chicago, the new system is said to completely eliminate the many problems and difficulties encountered by contractors in forming this special type of wall in sewage disposal plant construction.

Specially designed trusses, which can be made to handle any type, height, shape or wall thickness, are used in conjunction with standard UNI-FORM Concrete Forms to form the "Y" wall. Assembly of the truss and UNI-FORM Panels into a complete form, ready to receive concrete is a fast, mechanical operation. Positive internal spreading and accurate wall thicknesses are assured by the use of Universal Spiroloc Cone Nut Assemblies.

Features incorporated in the design and operation of the Universal "Y" wall form-



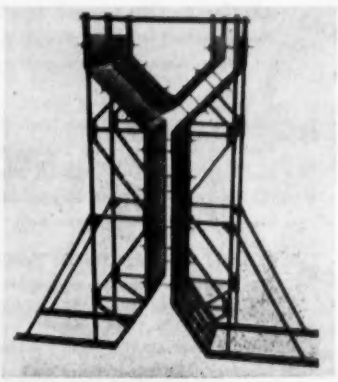
STRIPPED WALLS are clean and accurate

ing system eliminate the necessity of additional lumber or tying devices for the alignment and bracing of the unit.

Erection, stripping and movement of the form can be handled either as individual pieces or as a large unit. Both methods have been very successfully used on recent projects.

Because standard UNI-FORM panels are used to form a large percentage of the "Y" wall contact area, it is possible to strip all UNI-FORM panels within a very short time after the actual pouring of concrete, leaving the trusses in place to provide the necessary support for the required period of time.

In this way, faster forming cycles, using minimum UNI-FORM equipment are pos-



ASSEMBLED SECTION of "Y" wall truss with UNI-FORM Panels

sible, resulting in lower labor and material costs. UNI-FORM Panels are rented or sold, or rented with an option to purchase.

For complete details on Universal "Y" wall forms and UNI-FORM Panels, Write:

UNIVERSAL FORM CLAMP CO.
1238 North Kostner Avenue
Chicago 51, Illinois
Distributors and Branches in Principal Cities

NEW YORK THRUWAY CONTRACTOR ORLANDO SHOWS . . .

how to keep your shovels busy

A. J. Orlando Contracting Co. of Whitestone, New York, won a sub-contract to excavate and move one million yards of earth and rock on the anchor end of the New York Thruway. The job had to be completed before snow and other winter conditions set in—and this meant fast stepping!

To keep cycle time down, dynamic Anthony Orlando set up schedules that would keep the shovels constantly busy with a minimum number of trucks. This was a job made to order for his fleet of Mack six-wheel dumpers, bolstered by five new Mack LJSW-X six-wheelers.

Despite heavy rains and unusually soft going, the contract was carried out at a rapid pace to a successful conclusion. Says President Orlando, "For jobs like this, Macks are the only trucks I can afford to operate."

Macks are the mainstays of many a contractor who must keep up fast and uninterrupted hauling schedules. The famous Mack Balanced Bogie provides sure-footed traction in soft or slippery going. And when it comes to shrugging off punishment, Macks are in a class by themselves.

Have your Mack branch or distributor show you why, like Mr. Orlando, you can't afford *not* to operate Macks.

MACK TRUCKS Empire State Building, New York 1, N. Y.

(Advertisement)

170 cu. yds. per hour on 1600-ft. cycle

Tulsa contractor averages 170 cu. yds. hourly with TD-24s and B-250 INTERNATIONAL scrapers on 1600-ft. cycle while helping cut 24 per cent off length of Oklahoma highway

The D. W. Falls Construction Company of Tulsa holds the prime grading contract for 7.6 miles of Oklahoma State Route No. 20 between Hominy and Ralston. They were able to make cost-cutting short cuts in earthmoving operations on the project that cut travel distance 24 per cent by using three INTERNATIONAL TD-24 drawn B-250 scrapers moving 27 cubic yard-heaped loads, and push-loaded by a TD-24 crawler.

Take it from Supt. Bob Derington:

"It's really surprising how much dirt these big scrapers will move per day. Under fairly good working conditions, each unit gives me a day-after-day average of 170 cu. yds. of dirt an hour while working a 1,600-foot cycle."

You can get pay-off performance by hitching INTERNATIONAL scrapers to the TD-24—still the Champ of the crawlers with 161 drawbar horsepower. That's the kind of hook-up that loads, hauls and spreads faster than any other combination . . . day after day . . . year after year. Just call your INTERNATIONAL Industrial Power Distributor for demonstration proof. He'll bring the combination you specify anywhere, anytime so that you can see why INTERNATIONALS make every load a payload.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

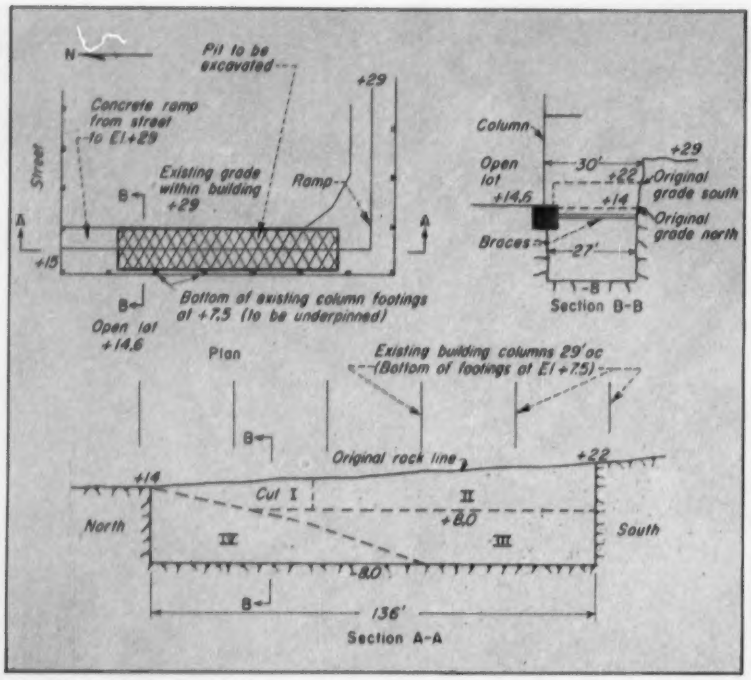
INTERNATIONAL
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD

INTERNATIONAL HARVESTER

SMOOTH-WORKING TEAM. Four INTERNATIONAL TD-24 crawlers and three B-250 scrapers delivered a total of 510 cu. yds. hourly on the 1,600-foot cycle for D. W. Falls.

TD-24 POWER FRONT AND BACK PUTS these kinds of 27 cu. yd.-heaped loads in the **INTERNATIONAL B-250** scraper in a matter of seconds for D. W. Falls on the company's 7.6-mile project requiring 250,000 cu. yds. of excavation.

EASY, FAST HAULING of heaped loads is assured with this equipment combination. The B-250 scraper requires minimum drawbar pull and has a low center of gravity that gives outstanding stability on side slopes like this.



DEEP AND NARROW PIT, inside New York City incinerator being modernized, had to be excavated in four stages and with various combinations of equipment. Pit is in solid rock.

TO MAKE CUT I, a 38-B Bucyrus-Erie 1½-yd shovel dug blasted rock and loaded into

Repeated Equipment Shifts Lick

3,500 YARDS OF ROCK EXCAVATION normally constitutes a relatively small job for Thomas Crimmins Contracting Co., New York City foundation contractor. However, when the excavation had to be accomplished within an existing building, in the form of a 27x136-ft pit 22 to 30 ft deep, the small job became a large one in terms of difficulty. Repeated equipment changes were necessary to lick it.

The problem arose as part of a subcontract for excavation and underpinning during reconstruction of the East 73rd St. Incinerator Plant under the supervision of the Department of Public Works of the City of New York. The new pit was located in an outer bay of the building (*see sketch*). Since the steel framework was to remain in place, the working-area width was restricted to approximately 30 ft by exterior columns at the building line. It was further restricted on the opposite side by an existing rock bluff within the building.

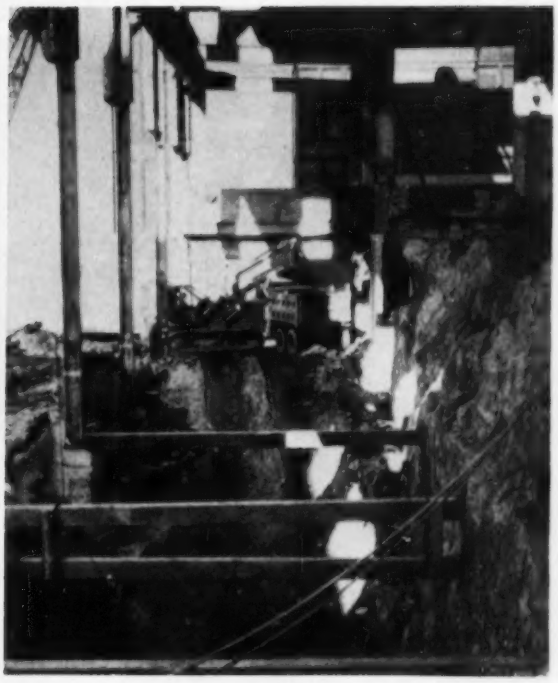
Initial work of removing a concrete-slab ramp from the area and demolishing a wall alongside was performed by a 1½-yd Bucyrus-Erie 38-B shovel and a Lorain L-41 truck crane operating with both a clamshell bucket and wrecking ball. This equipment stripped the entire area to rock. Once the rock was exposed, drilling, blasting and excavating were carried out in stages as shown in Section A-A.

The 1½-yd shovel started Cut I, working southward, and trucks backed into the area from the north. As the shovel ramped down to the +8.0 level, it gradually lost its effectiveness in that it could not place blasting mats to cover the shots. This made it necessary for the truck crane to cover the shots while the shovel only dug. The

(*Continued on page* 177)

TO MAKE CUT II, an Allis-Chalmers HD-20G 4-yd tractor-shovel loaded blasted rock into trucks that backed up to it. This method handled 80 cu yd per 8-hr day. It followed attempt to load out rock with 2-yd clamshell on lip of cut, which netted only 40 yd daily.

trucks. Truck crane handled blasting mats when shovel no longer could. Later, shovel had no room to swing, so had to be replaced.

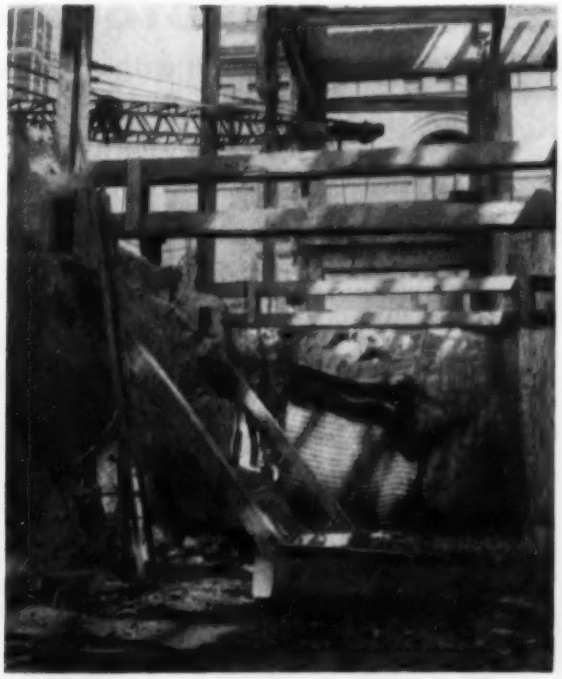


TO MAKE CUT III, the 4-yd A-C tractor-shovel had to go out to load trucks because the ramp was too steep for them to travel.

Tight-Quarter Excavation

BY REUBEN SAMUELS,
Foundation Engineer
Thomas Crimmins Contracting Co.

TO START CUT IV, a Drott shovel on an International TD-18 tractor was first tried. But its 2¾-yd rock bucket was too big to load into scale boxes efficiently, so it had to be replaced.



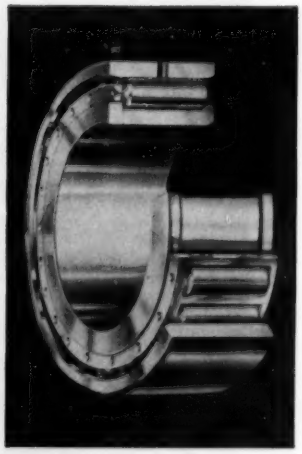
TO CONTINUE CUT IV, truck crane handled blasting mats, and rock was loaded into scale boxes by Drott 1¼-yd shovel on TD-9 tractor. The truck crane lifted loaded boxes out of the pit.

IN THE CRUSHED STONE INDUSTRY, TORRINGTON *Bearings are used in many applications including crushers, screens, shovels, cranes, pulverizers, grinding mills and rotary kilns.*

Photograph courtesy of Caterpillar Tractor Co.

TORRINGTON Radial Roller Bearings

are designed with one-piece bronze retainer that keeps rollers correctly aligned and effectively lubricated



Here are other reasons why TORRINGTON RADIAL ROLLER BEARINGS can meet your load and speed requirements. Only the finest quality steels, heat treated according to the most modern methods, are used in manufacture.

Precision tolerances and finishes on both rollers and races guarantee low eccentricity and uniform load distribution.

One-piece, cast-bronze cages help minimize wear, facilitate lubrication, and lengthen bearing life.

Machined pads in each cage-pocket guide the rollers accurately at the pitchline.

Specify TORRINGTON RADIAL ROLLER BEARINGS for your equipment. They are interchangeable in all types and sizes and custom engineered to meet the toughest, heavy duty assignments.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON RADIAL ROLLER BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller • Needle • Ball • Needle Rollers

TIGHT-QUARTER EXCAVATION . . .
Continued

FINAL DRILLING in inaccessible spots is handled by jackhammers. Other blast holes, and line drilling around edges of the pit, were wagon-drilled.

crane stood in the adjacent lot at the +14.6 level, reaching in between the existing columns. The shovel was rendered useless as it approached the spaces between the existing columns on the west and the rock bluff on the east, as there was not enough room to swing and load trucks parked on the north or on the lot to the west.

An attempt was made to work in Cut II with a truck crane standing on the lot and reaching in between the columns. Using a 2-yd clamshell to dig, and covering blasts with the same rig, proved impractical as the clamshell could load out only 40 yd per day. It was quickly replaced by an Allis-Chalmers HD-20G 4-yd front-end loader. This machine handled digging, and a truck crane standing in the adjacent lot covered the blasts with wire-rope mats. The front-end loader dumped into trucks backed into the cut from the north.

The loader-crane team completed Cut III in a manner somewhat similar to Cut II except that the loader backed up the ramp to load the trucks: the ramp slope was increased such that trucks could not travel it, yet the loader easily could. As the south end of Cut III was completed, it became necessary to install 12x12-in. timber bracing from the east face of the pit to the column footings on the west. This bracing, at the +8.0 level, served further to restrict the

PERMITS THE USE OF MORE ABRASION-RESISTANT, RUBBER-COVERED HOSE

Insure longer wear in your hydraulic hose assemblies—and at the same time, save assembly time by avoiding old-fashioned skiving. Joy Surgepruf re-usable couplings make *both* advantages possible. Their exclusive "double-wedge" grip lets you use tough, abrasion-resistant, rubber-covered hose instead of the braided type—without any need for skiving the hose at the connection.

NO SPECIAL ASSEMBLY TOOLS REQUIRED

You need no mandrels or other special tools to make up Surgepruf assemblies. No extra expense or special technique is involved.

CAN BE RETIGHTENED WHEN LOOSE ON THE HOSE

Machine vibration or hose flexing can loosen any hydraulic coupling on the hose in time, but Surgepruf Couplings can be easily, quickly retightened on the job to stop a leak—*another* exclusive feature.

Surgepruf Hose Couplings are made to JIC Standards. Assemblies are available in many sizes and lengths, and in both single and double-wire reinforced types for medium-high and high pressure service respectively. *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*

Get complete data on Surgepruf:
WRITE FOR BULLETIN H-100a
Consult a Joy Engineer

JOY
HYDRAULIC ASSEMBLIES THAT GIVE YOU MAXIMUM RELIABILITY

W&D H5506

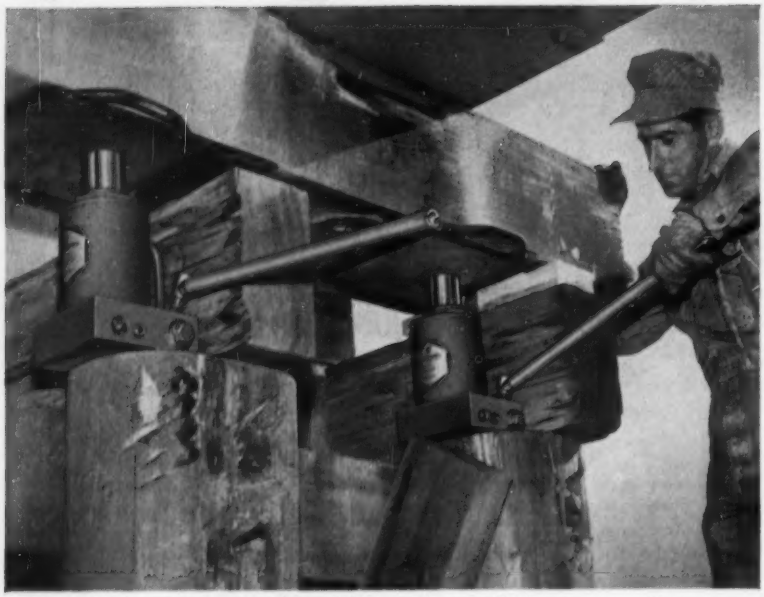
EASY DOES IT with MILLER Tilt-Top!

Big, heavy dozers, Barber Greene trenchers, rollers up to 10 tons and other massive construction equipment are loaded by ONE man in less than TWO minutes on a MILLER Tilt-Top. So easy too! Ground and platform merge into one surface for the easiest, fastest loading yet designed. Safer too, big wide oak decked platforms assure maximum operator and equipment safety. To cut time between jobs get a MILLER Tilt-Top.

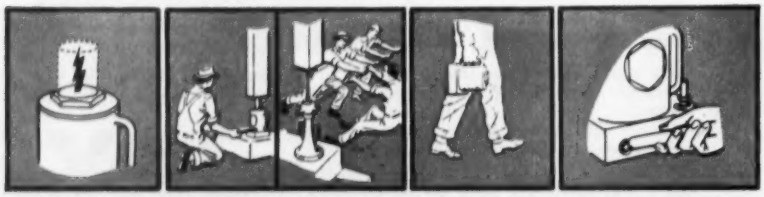
Model "BT-10" 10 TON
EQUIPMENT INCLUDED: platform, four 8.25x20x12 ply tires, heavy duty electric brakes with automatic electric break-away switch and controls, tires, lights, reflectors and safety chains.

SEE YOUR DISTRIBUTOR OR WRITE!
MILLER research engineers
457 S. 92nd Street, Milwaukee 14, Wis.

Here's how Blackhawk design speeds up jacking jobs



ONE MAN on a short handle quickly applies vast lifting tonnage. Above — two 50-ton Blackhawk Hydraulic Jacks supply precision raising and lowering to 1/1000 of an inch — promoting efficiency, safety and speed.



"Lightning Lift" —Exclusive double pump construction for quick load contact and easy power lifting.

More Efficient! One-man operated Blackhawk Hydraulic Jacks are 94% efficient as compared with only 12 to 30% efficiency for mechanical jacks.

Easily Carried by One Man! Compact, lightweight Blackhawk jacks are easy to position in tight spots.

Exclusive design features prevent damage—eliminate costly delays on the job. Avoid many expensive repairs to jacks.

More ease, too! This combination of big exclusive features is a sure key to less effort plus greater speed and better workmanship on jacking jobs. They are some of the reasons why Blackhawk Hydraulic Jacks are so superior.

You also have extra utility — by attaching a gauge (do it yourself easily) to test, weigh, etc. And Blackhawk Jacks last longer and are so trouble-free because they are fortified with exclusive design features proven by 27 years of field experience. Get Blackhawk Jacks (at new low prices) from leading supply houses.

Bank on Blackhawk for the **MOST COMPLETE LINE OF HYDRAULIC JACKS ...1½ to 100 Tons**

BLACKHAWK®

HYDRAULIC TOOLS • HAND TOOLS

BLACKHAWK MFG. CO., Milwaukee 46, Wis.

Dept. J-2355,

TIGHT-QUARTER EXCAVATION ...
Continued

working room by limiting the headroom to approximately 14 ft.

Cut IV was accomplished by still another combination of equipment. A Drott 1¼-yd front-end loader on an International TD-9 tractor filled scale boxes or battleship buckets placed in the bottom of the pit. These scale boxes were lifted out by a Bay City 190 truck crane positioned in the adjacent lot. This procedure allowed direct dumping of the scale boxes into trucks there. A second truck crane was used intermittently to cover the blasts as the work progressed to the north. Toward the end of the job the 1¼-yd loader was lifted out of the pit and final trimming, and the cutting for underpinning, was done by hand loading of the scale boxes lifted out by the truck crane.

Average production rates in the various cuts were:

Cut I . . . 1½-yd shovel loading directly into trucks; 80 yd per day.

Cuts II & III . . . 4-yd front-end loader dumping directly into trucks; 80 yd per day.

Cut IV . . . 1¼-yd front-end loader dumping into scale boxes with crane lifting and dumping scale boxes into trucks; 60 yd per day.

General contractor on the project is Psaty & Fuhrman, Inc. of New York City. Design and supervision were performed by the Department of Public Works, Frederick H. Zurmuhlen, commissioner, with Strobel & Salzman acting as consulting engineers. N. Miller was resident engineer for the Department of Public Works. B. W. Ellis was superintendent for Thomas Crimmins Contracting Co. When modernized, the incinerator will be operated by the New York City Department of Sanitation.

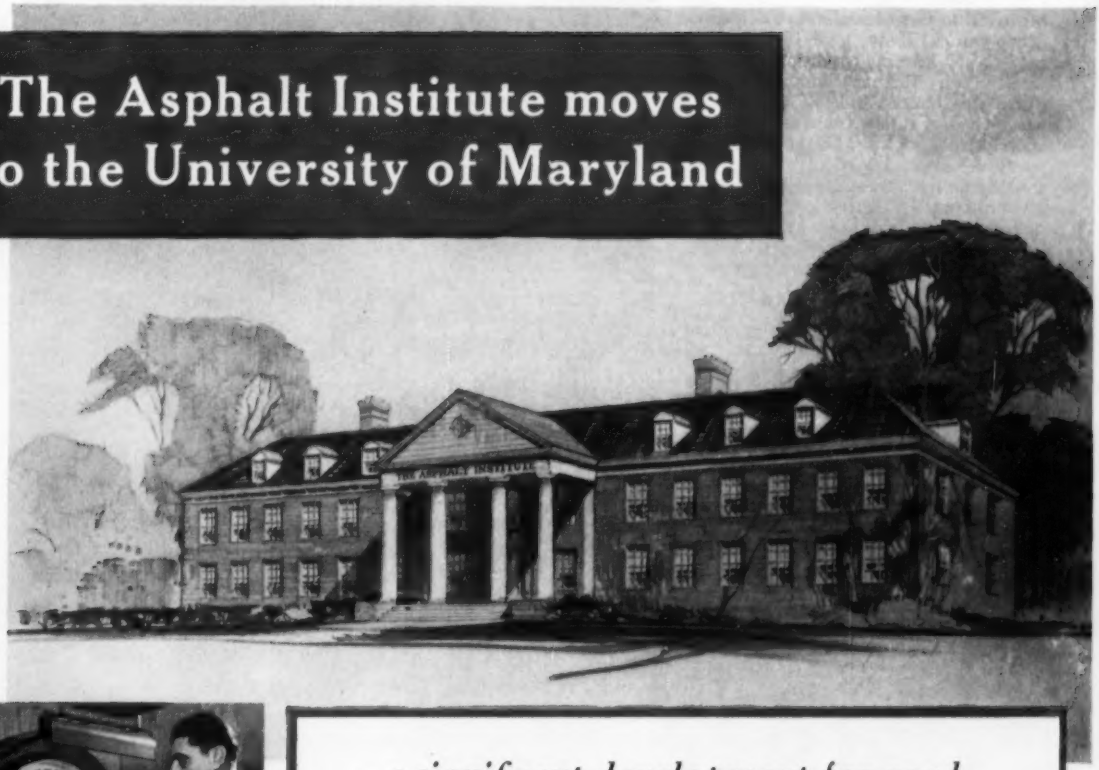
No Better Reasons

Pat Murphy attended a safety meeting. The boys had been given some printed instructions, and the safety man wanted to check results.

"Pat," he said, "Can you give me six good reasons for safety?"

"I can indade sir," replied Pat, "The four little Murphys, me wife and meself."

The Asphalt Institute moves to the University of Maryland



– a significant development for road builders and other Asphalt users

Universal testing machine for applying compressive loads to specimens of Asphalt paving mixes.

Unique multiple-temperature control apparatus for laboratory testing of Asphaltic materials.

As a member of The Asphalt Institute, The Texas Company takes pride in calling attention to the Institute's new, larger and better-equipped quarters on the campus of the University of Maryland. The new building was officially dedicated early this month.

To America's road builders in particular, but to all other asphalt users as well, this move is important because it substantially increases the capacity of The Asphalt Institute to serve them.

The new laboratory, which occupies the entire first floor of the Asphalt Institute Building, is several times as large as the former "lab" and it is equipped with a number of new pieces of testing equipment.

At the rear of the building, there is a large tract of ground which will be used to test the performance of asphalt under actual service conditions.

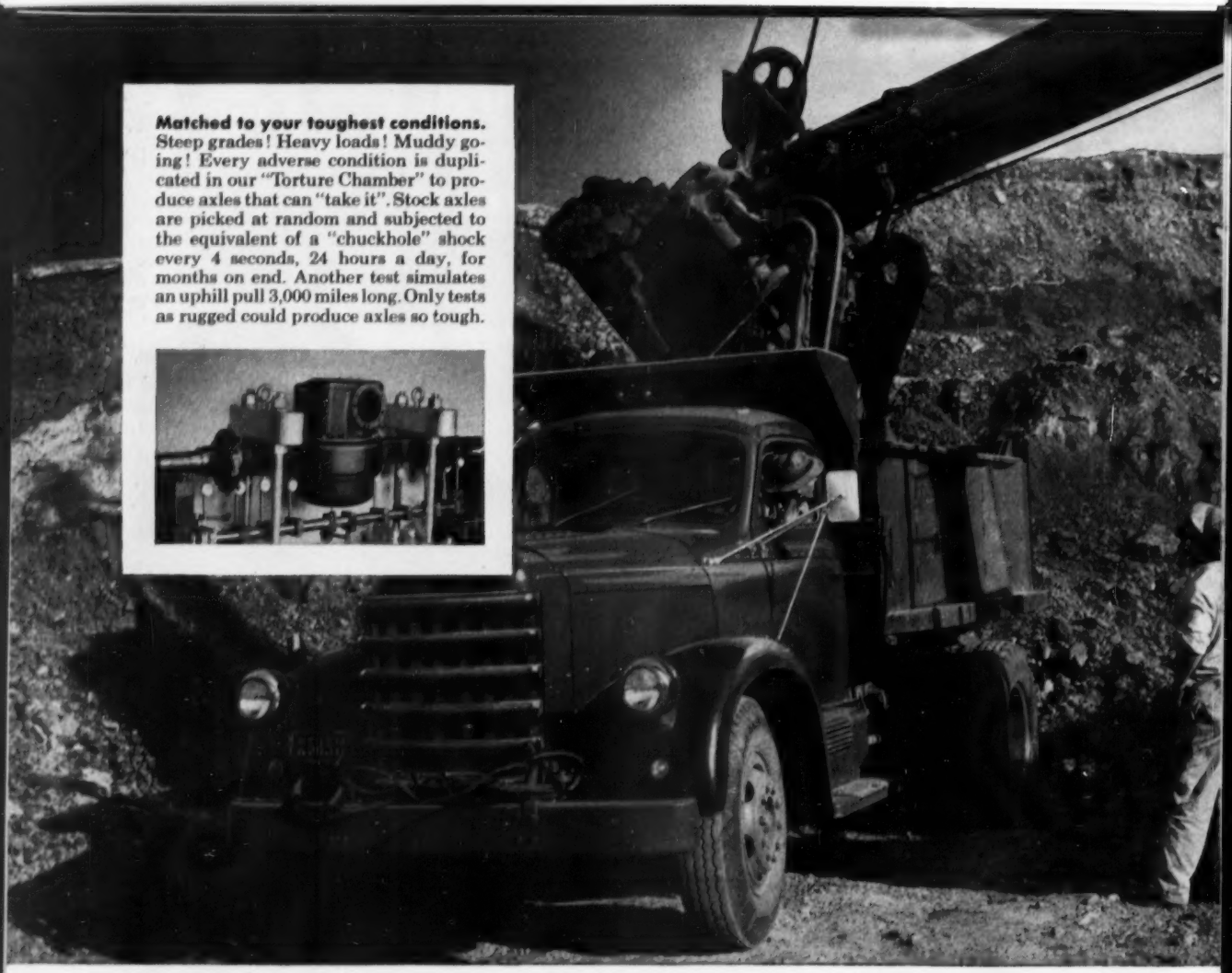
With the nation on the threshold of the biggest highway construction program in its history, this substantial enlargement of the capacity of The Asphalt Institute to serve road builders is particularly timely.

THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17

Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19

TEXACO

TEXACO ASPHALT



Matched to your toughest conditions. Steep grades! Heavy loads! Muddy going! Every adverse condition is duplicated in our "Torture Chamber" to produce axles that can "take it". Stock axles are picked at random and subjected to the equivalent of a "chuckhole" shock every 4 seconds, 24 hours a day, for months on end. Another test simulates an uphill pull 3,000 miles long. Only tests as rugged could produce axles so tough.

GREATEST ADVANCE SINCE T

exclusive double-reduction design
2-speed gear ratio spread!

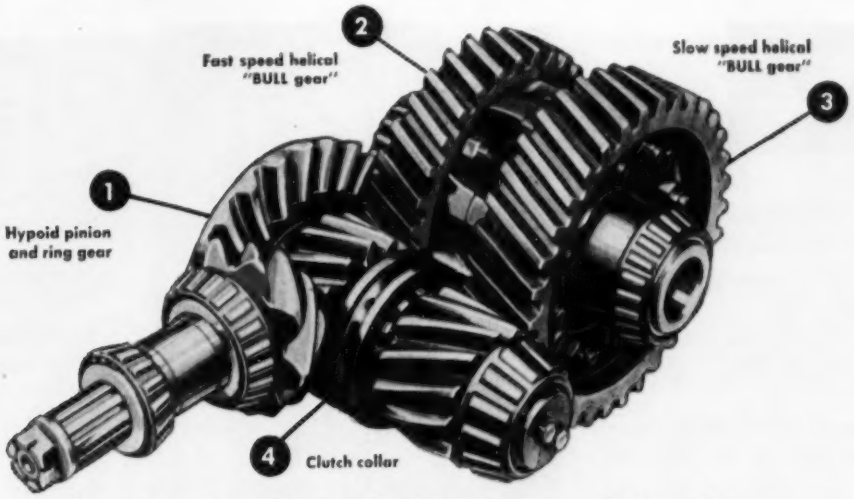
Tailor-made power exactly to your trucking needs with Timken-Detroit!

Unequalled flexibility! TDA 2-Speed Axles, give an almost *unlimited* choice of gear ratios. The Timken-Detroit design is so simple and basic, that an ordinary mechanical change lets you tailor power exactly to your trucking needs. Where other 2-speed axles limit you to only a single gear spread of 37%, TDA offers a range all the way from 28% to 49%.

TDA meets varied needs! The variety of hauling conditions that today's trucks must meet call for maximum speed and power flexibility. Other 2-speed axles are just too limited to meet this need. On the other hand, TDA's simple double reduction design gives complete flexibility. Gear ratio can be easily changed without weakening the axle unit in any way.

How you benefit! TDA not only gives you a much wider power range, but also, all the advantages of a stronger, sturdier, smoother operating design. Since helical "Bull" gear sets operate independent of one another, there is no overheating even after indefinite running in low speed. Bigger huskier TDA parts last longer, stand up better under tough usage.

Less down-time, longer axle life, fewer repairs, higher fuel economy, lower operating costs and higher profits. These are some of the important reasons why so many leading manufacturers and operators everywhere specify Timken-Detroit 2-Speed Axles.



How the exclusive double-reduction design of

TDA 2-SPEED AXLES

gives you greater speed, endurance, and economy!

This is HOW TDA's 2-Speed principle works! A husky hypoid ring gear and a bigger, stronger pinion set (No. 1 in illustration above) provide the *first step* of the total gear reduction for both fast and slow ratios. Two large, heavy-duty helical gear sets provide the *second step*. Both sets are of balanced size and capacity. One set (No. 2 in illustration) is for fast speed; the other (No. 3) is for slow speed. The clutch collar (No. 4) moves to right or left to engage one helical pinion or the other.

WHY this principle offers far wider spread! Because the TDA design is so simple, the ratio may be changed merely by changing the low speed helical gear pinion. Unlike ordinary designs which are limited to 37%, TDA offers spreads of 28%, 37%, and 49%. In effect, this flexibility gives you your choice of power ratios to exactly match your needs.

Greater endurance, longer truck life with TDA. TDA's simple design eliminates small complicated parts and midget size gears. Large hypoid helical design gives more teeth in contact – quieter operation and far less strain. Bearings are larger, too. Helical "Bull Gears" not in use idle, further reducing wear. All this adds up to longer engine life... and more efficient and profitable operation under all conditions.

THE FIRST 2-SPEED AXLE

gives TDA world's widest

TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted Standard
TRADE MARK REGISTERED

World's Largest Manufacturers of Axles for Trucks, Buses and Trailers

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio New Castle, Pennsylvania

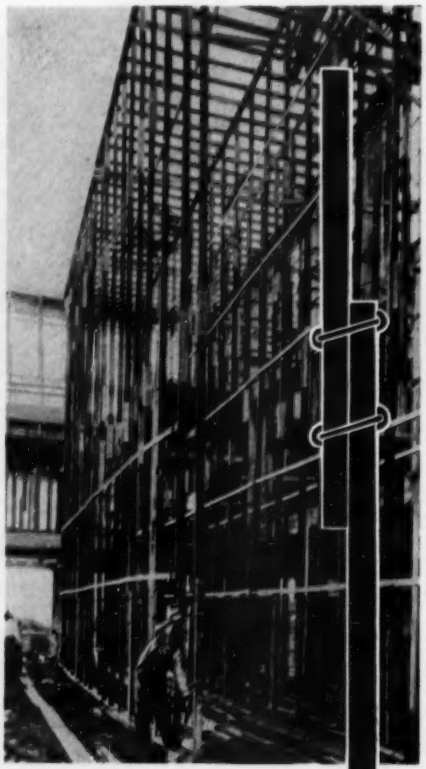
Increase axle life with GENUINE TDA EQUIPMENT PARTS

Take no chances with ordinary replacement parts. For sure, dependable factory-type jobs, specify genuine Timken-Detroit axle parts kits—identical to your axles' original equipment.

Each kit is complete — gives you everything you need in one handy package. Gaskets and shim parts, brake liners, steering knuckles, differential gears — for every size of brake and axle. Order by number from your dealer. Cut labor and adjustment costs. Get trucks back on the road quicker.

Elis

Adjustable Shores Go Up, Up, Up
As Costs Come Down, Down, Down
On High-Level Concrete Forming!



Man controls height adjustment from ground level with Elis Jack and Elis Clamps.

40 to 50-Foot Story Heights No Trick for Elis Methods

Here's actual job proof that Elis Shores can be adapted to almost any situation in suspended concrete floor construction. The standard 7' 0" lower shore member with two Elis Clamps is used, and the upper shore member is of extended length to reach over 40 feet high. . . . still one man can adjust it with the Elis Jack.

MFD. BY ELIS EQUIPMENT CO., INC., 211 N. W. 4th ST., OKLAHOMA CITY, OKLA.

$AVE with STERLINGS

SAVE MUSCLE POWER
Balanced construction puts 80% of the load on the wheel . . . only 20% on the operator.

SAVE DOLLARS
Sterlings pay off in PROFITS. Their unusually long service life protects your initial investment. And maintenance costs are nil.

You profit two ways with easy-wheeling Sterling Barrows. (1) You save muscle power because Sterlings glide along with a minimum of effort. (2) You save dollars because Sterlings are made to outlast any barrow on the market . . . give you many additional years of service. Compare costs with other barrows. You'll find Sterlings actually cost less per year.

STERLING CSW
Maximum capacity 5 cu. ft. 16 gauge tray, all-welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

DEALERS
Ask about our liberal dealer selling plan. Write for catalog.

Costs Less per Year

Look for this Mark of STERLING Quality

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Sterling WHEELBARROWS

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Huber-Warco Co.: Announces the appointment of R. G. Moeller Co., 14415 Meyers Road, Detroit, Mich., as distributor of its line of tandem rollers, three-wheel rollers and graders. Other distributors named by Huber-Warco: Caird Engineering Works, Helena, Mont.; The Sawtooth Co. of 1115 Grove St., Boise, Idaho; The Bode-Finn Co., 2650 Spring Grove Ave., Cincinnati, Ohio; Road Machinery Co., Devon, Pa.; O. S. Stapley Co. of Phoenix, Ariz.; Equipment Distributors, Inc., Charleston, W. Va.; The Gledhill Road Machinery Co., Galion, Ohio. Elphinstone, Inc., Baltimore, Md.; Long-Talbott Equipment Co., Columbia, S. C.; Boehck Engineering Co., Houston, Tex.; Wilhelm-Davies Co., Inc., Wallingford, Conn.; Kessler-Simon, Oklahoma City, Okla.; R. B. Wing & Son Corp., Albany, N. Y.; Dempster Brothers, Inc., Knoxville, Tenn.

General Electric Co.: Harris Hardware & Supply Co., Inc., Kingston, Pa., was recently appointed an authorized Carboloy carbide distributor. It will handle Carboloy's standard and special carbide metal cutting tools, as well as its diamond grinding wheel dressers. General Electric also added three new distributors to handle products of its welding department: Weld-Arc Sales and Supplies, Inc., New York City; Interstate Welding Supply Corp., Elizabeth, N. J., and T. H. Green, Rochester, N. Y.

Clark Equipment Co.: Nicholas A. D'Arcy of Huntington Park., Calif., has been appointed factory representative for Clark's Automotive Division to handle its line of axles, transmissions, torque converters and complete power trains in several counties in southern California, Clark county in Nevada and the state of Arizona. Assisting Mr. D'Arcy are George Riley and John Eber. Another distributor appointed to handle the Michigan line of excavator-cranes and tractor shovels, products of the Construction Machinery Division, is Mork-Witthauer Equipment Co., of Minneapolis.

The Warner & Swasey Co.: Three new distributors have been appointed by the Gradall Division: For

(Continued on page 185)

With Fuller Model 10-A-1120 Transmissions in fleet of 23 Autocars, Allegheny Construction Equipment Company is getting more work time, less downtime through the right gear ratios to meet load and grade, with shorter, easier shifts that help provide faster work cycles.

300,000 miles . . .
no transmission downtime

Allegheny Construction Equipment Company of Pittsburgh, Pa., select their trucks and truck components with profitable operation in mind.

Today, a fleet of 23 Autocar dump trucks is rounding out its fifth year for Allegheny Construction. The trucks are powered by 165 hp diesels working through Fuller 10-A-1120 Transmissions. Already, many of the trucks have topped the 300,000-mile mark . . . *with no transmission downtime.*

Allegheny, like other leading contractors in the construction industry, knows the critical importance of having *correct transmission ratios to meet heavy loads and adverse grades . . .* under *severe operating conditions . . . and controlled by short, quick, easy shifts.* They specified Fuller Transmissions to get correct ratios and long life in their Autocars. *That's why more equipment owners and users specify Fuller than any other transmission.*

And that's why with over 110 Fuller models to select from—both semi-automatic and full-manual control—*you'll find a transmission designed to do your job . . . better . . . at less cost.*

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

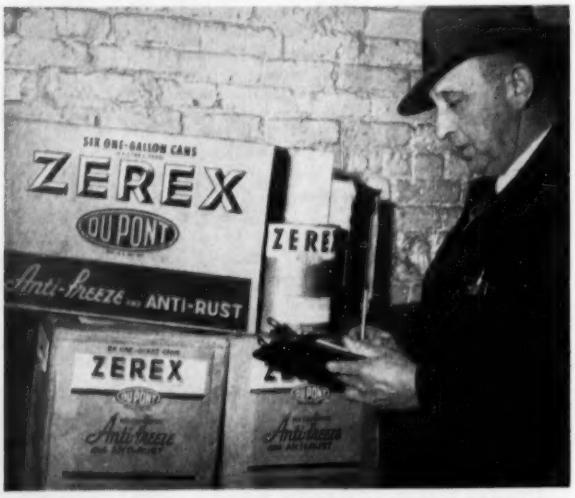
"Our contracting business has no seasons, thanks to Du Pont 'Zerex' anti-freeze"

—says **ROLAND S. SPENCER,** Superintendent of Equipment, C. W. Blakeslee & Sons, Inc., New Haven, Conn.

"Whether we're resurfacing a dam or patching someone's driveway, we have a reputation for doing the job properly . . . and on time. Our customers rely on us," says Roland Spencer, "and in turn, we must rely on our equipment. There are no seasons in our contracting business. We don't alibi that it's too cold to work."

"A lot of jobs depend on a single piece of equipment. And when there's a deadline to meet, downtime can cost plenty. Rental on some of these machines runs $250 a day. That doesn't count the wages of working crews. So, mister, we can't afford a single breakdown. That's why we pay so much attention to preventive maintenance."

"To make sure none of our equipment—including our largest cranes—will let us down, we check it constantly. We begin winterizing in October with 'Zerex.' Du Pont 'Zerex' gives us the best possible protection against freeze-ups. What's more, there's no problem of 'boil-away' on warm days. We often leave our anti-freeze in the radiators right into late spring just in case there's a sudden unseasonable freeze."



"We know we're safe with 'Zerex.' It's got a good rust inhibitor, too. And 'Zerex' pours clear. It doesn't have that oily substance that often clings to radiators, collecting rust and dirt. We're pretty fussy about keeping the water systems absolutely clean. And we've never had trouble with gummy or clogged radiators since using Du Pont anti-freeze. 'Zerex' saves us plenty of money and plenty of worry, too."

DU PONT

ZEREX

REG. U. S. PAT. OFF.

Anti-Rust ANTI-FREEZE

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON, DELAWARE

SALES AND SERVICE ...

Continued from page 182

western New York, Dow & Co. of Buffalo will be distributor for multi-purpose Gradall machines. For Arizona, State Tractor & Equipment Co., Phoenix, will handle Gradall sales and service and the Stith Equipment Co., Atlanta, will be the representative in Georgia.

LeTourneau - Westinghouse Co.: Reddco Equipment Co. of Bedford, Ohio, has been named distributor for the northern portion of Ohio. Principals connected with Reddco, formerly associated with the Torcon Corp., are Henry A. Betts, president; Thomas S. Bednar, vice-president, and Francis L. Kuhn, service manager. Other distributors recently appointed by this company are: Choate Equipment Co., Cedar Rapids, Iowa, for eastern Iowa; Columbus Equipment Co., Columbus, Ohio, for nine counties in Ohio.

Pioneer Engineering Works, Inc.: Cook Bros. Equipment Co. of Los Angeles and Oakland, Calif., has been appointed distributor in California and southeastern Nevada for this company's equipment. It will handle the line of Pioneer Continuflo equipment for mine, pit, quarry, aggregate production and highway construction industries. Two other Pioneer distributors are Choctaw, Inc., of Memphis, Tenn., and Brock Tractor Co. of Buffalo, N. Y.

On the Sales Front

American Steel Dredge Co.: Wayne Shovel & Crane Division announces the appointment of Don Mansfield of Fort Wayne, Ind., as the new central district representative of its line of ½- and ¾-yd power shovels and industrial yard cranes.

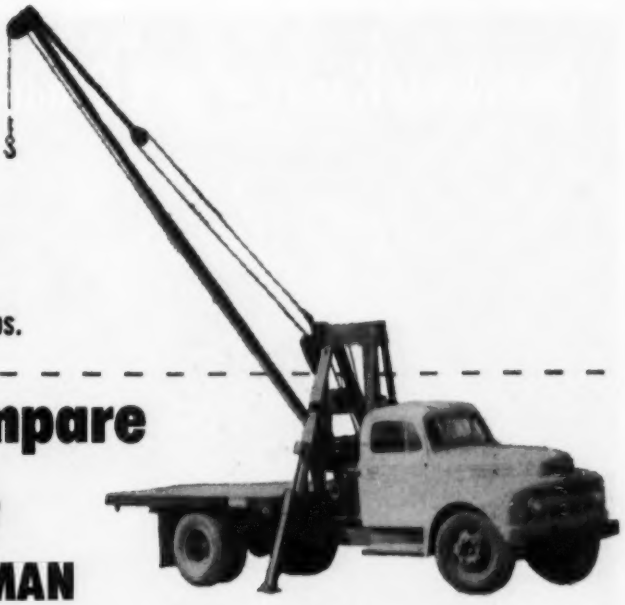
Twin Disc Clutch Co.: Jack N. Yetter has been promoted from sales promotion manager to sales manager, filling the vacancy caused by the retirement of E. C. (Ted) Billings.

Fairbanks, Morse & Co.: John C. Elmburg, formerly manager of the company's Portland, Ore., branch, has been appointed assistant general sales manager, effective July 1st.

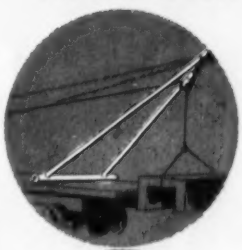
Joy Manufacturing Co.: Donald L. Archibald has been named district sales manager in the New England area.

Blaw-Knox Co.: Robert A. Troman has been promoted to sales manager of the Tower Department, equipment division of the company. He replaces A. H. Jackson who was recently promoted to manager of engineering and development.

for lifting jobs up to 6400 lbs.



compare the PITMAN HYDRA-LIFT with



A-frame Hydraulic power swings Hydra-Lift's boom 180°, lifts it through arc of 100°. With Hydra-Lift you're ready instantly to handle any lifting job within 180° radius of truck, **without moving the truck.** And because Hydra-Lift requires only 40" behind cab, you can still use truck bed for normal hauling.

Hand Labor Hundreds of owners use Hydra-Lift for lifting jobs they formerly did by hand because a crane was too expensive. Low-cost Hydra-Lift has changed that. More than half of all Hydra-Lifts sold pay for themselves first year, largely because of labor savings.

Heavy Duty Crane For lifting jobs up to 6,400 lbs., Hydra-Lift offers you all the advantages of an expensive, heavy duty crane, at only a fraction of the cost. And, because it moves from job to job at normal truck speeds, Hydra-Lift is far more economical than heavier cranes on scores of jobs.

The Winner on all Counts. Hydra-Lift is the amazing new truck crane that is saving hundreds of owners thousands of dollars a year. Why not get all the facts. Fill out and mail this coupon today.

Pitman Manufacturing Company
300 West 79th Terrace
Kansas City, Missouri

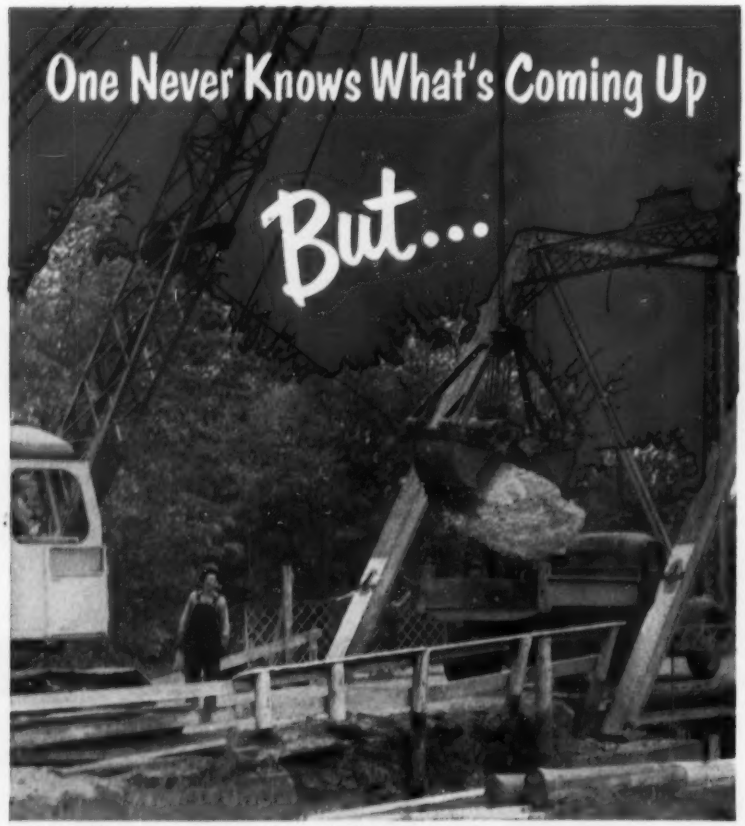
Please send me full details on the Pitman Hydra-Lift.

Name..... Title.....

Company.....

Street.....

City..... State.....



Crane Photo courtesy Northwest Engineering Co.

UP IT COMES
If it's an OWEN

Experienced contractors can determine with reasonable accuracy the general digging conditions they face, but they can hardly anticipate encountering unusual conditions such as illustrated.

If their digging equipment embodies the needed factors of extra power and strength, these problems are "taken in their stride" and the object is removed with out delay.

Owen, through long years of specialized experience, anticipates such difficulties in the design, engineering, and construction of their buckets. This is one of the factors that accounts for the dominant position that Owen buckets hold in excavating operations today.

Send for free illustrated catalog.

THE OWEN BUCKET CO.

6020 Breakwater Avenue • Cleveland, Ohio

Branches: New York Philadelphia Chicago Berkeley, Calif. Fort Lauderdale, Fla.

SALES AND SERVICE ...
Continued

Harnischfeger Corp.: Ray Morgan has been appointed special representative of the Power Crane & Shovel Division, promoting and coordinating all sales activities for the P&H Single Pass Soil Stabilizer and the Sierra Elevating Loader.

Cummins Engine Co. Inc.: R. R. MacDonald is in charge of the newly opened Piedmont regional office of the company at Greensboro, N.C., to serve the territory which consists of the states of Virginia, West Virginia and North and South Carolina.

In the Main Office

Allis-Chalmers Manufacturing Co.: Robert S. Stevenson has been elected president of the company to succeed the late William A. Roberts who died April 12th of a heart attack after 31 years' association with Allis-Chalmers. Mr. Stevenson, the new president, joined the company in 1933 and at the time of his election was executive vice-president. He is a member of the Milwaukee County Expressway Commission, a director of the National Safety Council, and a member of the American Road Builders Association.

Wisconsin Motor Corp.: Advancements announced: Phil Norton, vice-president in charge of sales, has been named executive vice-president; F. B. (Bill) Esty has been advanced to chief engineer; Ralph Sweitzer is the new director of research and development; Miss Ann M. Crantz has been named assistant secretary of the corporation.

Association Activities

American Society of Civil Engineers: William H. Wisely takes office this month as executive secretary of the 38,000-member organization, oldest national organization of engineers in the country. He succeeds Col. William N. Carey who held the post for the last 10 years and is retiring as executive secretary-emeritus.

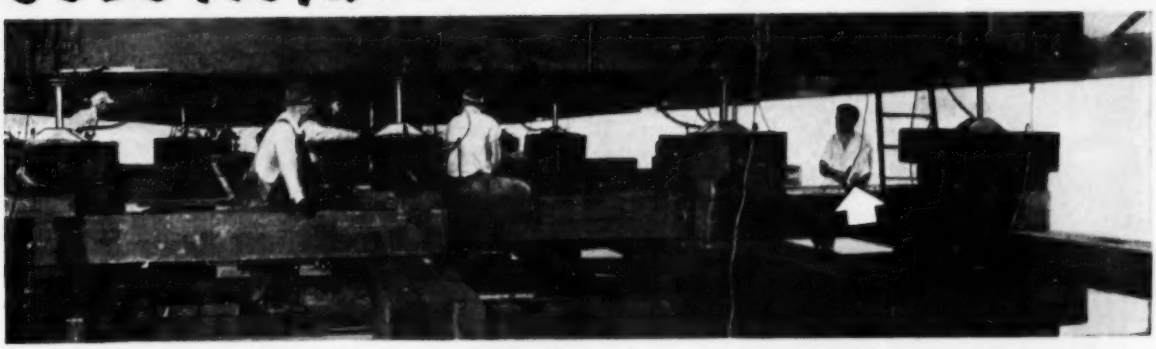
National Association of Home Builders: Ralph J. Johnson, chief of Housing Hygiene Activities, U. S. Public Health Service, will join this Association as director of the construction department and research institute.

National Sand & Gravel Association: Robert P. McKenrick, vice-president and general manager of Blaw-Knox Co.'s construction equipment division, has been reelected chairman of the Manufacturers division. He will also serve on the Board of Directors.

PROBLEM: RAISE A BRIDGE 20 FEET . . .

When this photograph was taken the jacks were suspended (in their supporting blocks) from the bridge deck while the cribbing was raised to the next jacking level.

SOLUTION: RODGERS HYDRAULIC JACKING UNITS!



It isn't often that you have to raise a bridge, but when you do, you'll discover why versatile, powerful Rodgers Hydraulic Jacking Cylinders and Pumps were selected by the Engineering Department, City of Minneapolis, as the safest, quickest and lowest cost method for raising two bridges spanning the Mississippi River. Both structures were raised twenty feet as part of the development of the upper river harbor.

One bridge, consisting of four 200 foot spans and the other, consisting of six 156 foot spans, were raised by lifting one span at a time. To do the job, twenty 50 ton jacking cylinders were placed on cribbing—10 at each end of the span to be raised. An electrically powered hydraulic pump operated the group of ten cylinders at each end. A 13 inch ram travel on the jacks produced completed lifts of an average of 5 feet per 8 hour day, including all cribbing and staying assemblies.

Remote, push button controls permitted the pump operator to go under the bridge where he could watch each lift first hand. The individual pumping source at each end assured absolutely equal lifting force at every jacking point.

Rodgers Hydraulic Jacking Units with hand or powered pumps can be used wherever needed to PUSH, LIFT or PULL. Available in capacities from 50 to 600 tons with standard ram travels from 6 to 48 inches. Ram travels to 72 inches available on special order. Rodgers engineering department will be glad to assist you in the selection of the exact jacking units required for your particular lifting, pulling or pushing job—large or small.

FREE—Complete report on the jacking phase of the bridge raising job described above—written for you by the engineer-in-charge! Ask for Bulletin 327. You'll also want Rodgers free Bulletin 317A. It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, and a description of hydraulic equipment used in the construction of tunnel shields.

HYDRAULICS Rodgers

Rodgers Hydraulic Inc.

7403 WALKER STREET • MINNEAPOLIS 16, MINN.

They're here! GMC's ten-wheelers...

BLUE CHIP GMC TRUCKS

Model MW630-50 (46,000 GVW) above is one of GMC's new ten-wheelers—now available up to 59,000 GVW. It is powered by an improved 225 h.p. gasoline engine—has Hydra-Matic Drive.

19 new Blue Chip

and 9 of them are Hydra-Matic*

Now—here's an entire new line of super ten-wheeler trucks—in the Blue Chip GMC's for the construction field! In 19 extra-rugged models—all the way up to 59,000 GVW—you get:

BLUE CHIP POWER—All 19 have new, power-boosted engines. 4 gasoline and 2 Diesels cover a 155 to 230 h.p. range. And GMC's new 175-h.p. V8 makes its bow in 40,000 GVW models.

BLUE CHIP RUGGEDNESS—Frames are up to 11% stronger. For extra-tough work, stress-relieving reinforcements to the end of the frame are now factory-installed.** Clutches are larger on manual-shift models. Axles are bigger—front and rear on most models.

BLUE CHIP CHOICE OF HYDRA-MATIC MODELS—Hydra-Matic's extra protection is now available up to 46,000 GVW. It ends all the time and money lost to clutch troubles—to shock-loading damage—to engine strain.

BLUE CHIP DRIVER EFFICIENCY—Hydra-Matic makes any driver an expert. All gearshifting duties are handled automatically. Trucks are spared abuse. Fuel savings are impressive. Safety Power Steering** is available on all 19 trucks.

• • •

And wait till you see these Blue Chip GMC's price-tags—till you've had the chance to match them against any competition! You can't afford to buy another truck until you check your GMC dealer!

*Truck Hydra-Matic standard equipment on many GMC's; optional at extra cost on some others

**Optional at extra cost

Your key to Blue Chip value

Get a modern truck!

GMC TRUCK & COACH—*A General Motors Division*

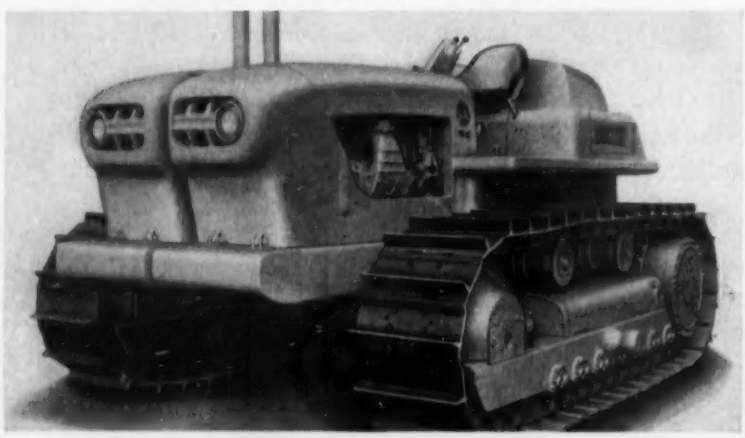
CONSTRUCTION EQUIPMENT NEWS

Utility Crane

The UC-68, a 15-ton self-propelled, rubber-tired crane travels from job to job at speeds up to 7 mph. Equipped with an independent rapid boom hoist, it offers power-controlled raising or lowering of the boom. Like all Link-Belt Speeder machines, the crane features Speed-o-Matic hydraulic control. It is powered by gasoline engine with torque converter. **—Link-Belt Speeder Corp., Cedar Rapids, Iowa.**

Tractor Loader

Designed for use only on Cat D 2 tractors with non-oscillating frames, the fully hydraulic TL-20 loader boasts fast lifting speed and increased maneuverability. With break-away power at ground level of 5,000 lb, it has a guaranteed lift of 3,000 lb at full 9-ft lifting height. The following attachments are usable: rock and light-materials buckets, lumber and logging forks, scarifier and ripper.**—Teale & Co., Omaha, Neb.**



Twin-Engine Crawler Tractor

The Euclid TC-12 twin-engine crawler tractor, (CM&E, Oct. 1954, p 98), with new sports-car type styling, is now in limited production. The TC-12 is powered by two 194-hp, GM 6-71 diesel engines, each driving one track through separate Allison Torqmatic drives. The operating weight is 58,000 lb. For shipping purposes, the tractor can be separated into halves. The big machine uses standard GM and Euclid components, found in many other items of construction equipment, reducing owners' spare parts inventories.**—Euclid Division, General Motors Corp., Cleveland 17, Ohio.**

Self-Propelled Roller

SP-54, a self-propelled, 9-wheel roller, has hydraulic steering and torque converter drive. The 9-ton compaction load is evenly distributed at 265 lb per in. of width. Oscillation of front and rear wheels is available.**—Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., SE, Minneapolis 14.**

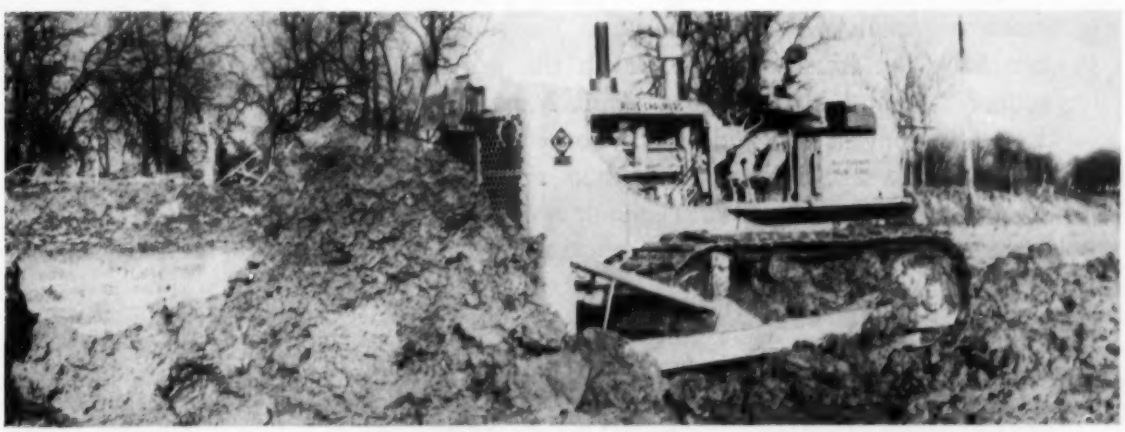
On-the-Job Previews of Machinery, Tools and Equipment

Cement Batch Plant

Designed for easy erection and dismantling, the Batchmaster E-3 cement plant can carry any size batcher up to 70 cu ft. It can be hauled over roads without special permits. It provides a wide truck entry.—**Heltzel Steel Form & Iron Co., Warren, Ohio.**

Aerial Lift

The Sky-Worker Tree King provides off-the-ground workers with a new high in maneuverability, safety and efficiency. The manufacturer claims that with this machine, two men can do the work of a six-man crew using climbing methods. It has an extended height of 39 ft above the ground and a horizontal reach of 30 ft. The unit is a complete working package consisting of truck, aerial lift, platform body, cab guard, air compressor and a pneumatic pruning tool. Auxiliary controls at the unit base are an added safety factor.—**Tey Mfg. Co., Milford, Conn.**



New A-C HD-16 Diesel Crawler Tractor Announced

The second completely new A-C tractor this year, the 31,500-lb. HD-16 is available with torque converter drive and standard transmission.

The HD-16 has the new Allis-Chalmers 6-cyl, 844 cu in. diesel engine which develops 150 hp at 1,800 rpm with the torque converter and 140 hp at 1,600 rpm with standard transmission.

Maximum drawbar pull of 60,000 lb is claimed with the torque converter drive. The standard transmission tractor has a maximum drawbar pull of 31,700 lb. Under overload, the engine torque increases, thus resulting in additional drawbar pulls up to 35,945 lb at reduced travel speed. These high drawbar pulls are engineered into the tractor to take full advantage of the additional weight and traction available when attachments such as dozers, shovels, etc. are used.

The basic design of the new crawler features an

(Continued on page 192)

Send for the RAMSET PROFIT ENGINEER with his new *How-to-do-it Application Data.* They're both chock-full of practical ideas for better, lower cost fastening into steel and concrete. This RAMSET 3-way combination of men, methods and the most versatile Jobmaster Tools and Fasteners can help you estimate closer, finish the work sooner . . . and increase your Profit Margins. From the longest and widest experience in the industry, RAMSET PROFIT ENGINEERS are best qualified to serve you on your fastening problems. Call your local dealer or mail the coupon.

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Please send new How-to-do-it Application Data showing RAMSET proved ideas for
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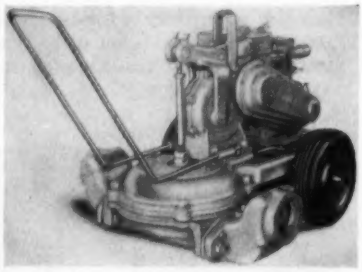
all-steel, box-type "A" main frame of unit construction for easy service accessibility; one-piece, line-bored steering clutches and final-drive housing for longer gear life; straddle-mounted double-reduction final-drive gears mounted on tapered roller bearings to eliminate gear spreading and corner loading of gears; and roller-bearing truck wheels with 1,000-hr lubrication to save maintenance time.

A new feature is the wrap-around radiator guard which tilts forward and down for easy accessibility. The guard reduces the cost of tractor-dozer packages because the hydraulic rams or cable-lift sheaves mount directly on it, thus eliminating the need for a separate dozer lift frame.

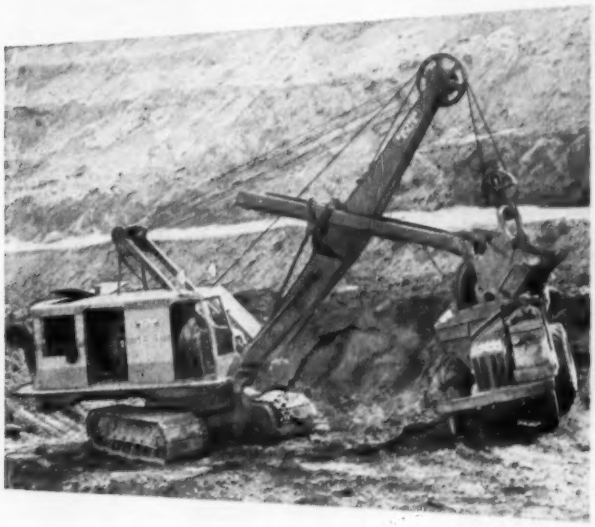
The fuel tank is made of 3/16-in. steel plate to withstand shock. With an eye towards the operator's comfort and efficiency, A-C has included a new adjustable foam-rubber seat; finger-tip-controlled hydraulic steering and 24-v electric starting.—**Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.**

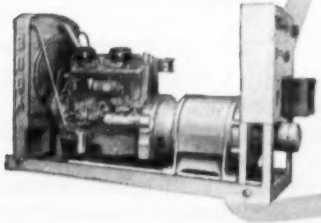


DIAPHRAGM PUMP—Called the Skwee-Gee Pump, this unit has a variable speed, rubber-cushioned, vertical stroke plunger for longer diaphragm life and trouble-free operation and is ideal for jobs ranging from dewatering to pumping sludge. Priming characteristics are excellent so it is well-suited for applications involving high suction lifts, seepage control or small well-point dewatering jobs. Skwee-Gee has a standard plunger stroke of 3 in. with alternate 2¾ in. available by simple adjustment. Pump body, valve housing, gear case and frame are aluminum for light weight. Mechanical components and engine are sized to provide operation at maximum capacity with heads up to 40 ft. Suction and discharge connections are 3 in. bushed to 2 in. so that the pump may be used as either a 2- or 3-in. pump.—**Construction Machinery Co., Waterloo, Iowa.**

BUDA DIESELS

MONEY MAKERS IN YOUR SHOVELS AND DRAGLINES...





EQUALLY PROFITABLE IN ALL YOUR OTHER EQUIPMENT

When leading Shovel and Dragline builders pick Buda Diesels to power their equipment they choose them for good reasons: —longer life, lower operating cost—minimum maintenance . . . more power . . . greater torque . . . extensive parts & service.

These same money-making advantages of Buda Diesels can be applied to almost every other piece of construction equipment you own. Don't miss a chance to repower with Buda Diesels . . . they're designed with your profits in mind.

Facts and performance sell Buda Diesels. Get full details from your nearby Buda Distributor today. Write for Bulletin.

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ALLIS-CHALMERS MANUFACTURING COMPANY

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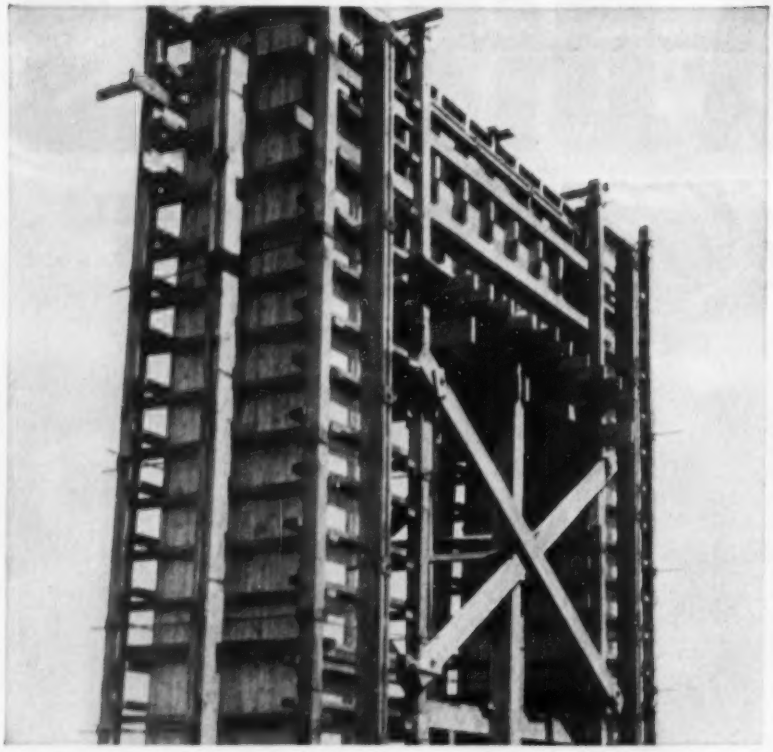


Use of Richmond Adjustable Tyscrus and Lagstuds on This Pier Job Saved the Contractor Money.

Concreting Delays Eliminated by Richmond Lagstuds

Adjustable Tyscru System Means Increased Profits for Contractors

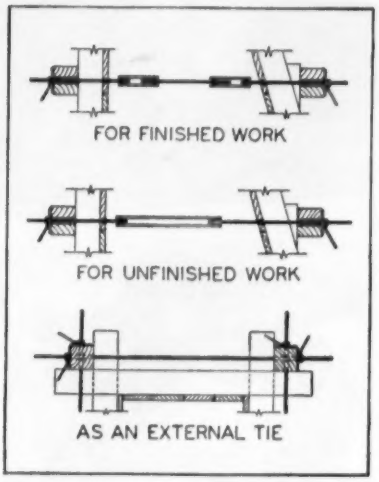
Forced by stiff competition and rising labor costs into closely examining operating techniques, experienced contractors in heavy construction have succeeded in reducing many operational expenses. This has been accomplished by improved techniques and, in large measure, by carefully calculating on-the-job needs and ordering materials and equipment to definite specifications. Yet in most construction areas certain problems must still be solved right in the field. While it is possible in concrete form work, for example, to predetermine accurately 80% to 90% of the tie needs on a job and to order specific sizes, the remaining 10% to 20% present special, unforeseeable conditions. These "specials" were long a headache.

Richmond Continuous Threaded Lagstud

The Adjustable Tyscru System was developed by Richmond for just such emergencies. In the past when special conditions in concrete form work called for a non-standard tie or special rod, the contractor was faced with several alternatives. Once the size was ascertained he could order it from the factory—which meant costly delay; or by using the she-bolt system he could have an inside rod cut and threaded in his machine shop—which also meant that his crew was held up until the piece was finished. Of late years, however, he has been able to use Richmond Continuous Threaded Lagstuds which, combined with Tyscrus, eliminate such delays in operations. By simply cutting a Lagstud to the desired length right at the form, the needed piece is immediately available. The time saved in uninterrupted operations means substantial economies on the job.

Already in wide use by leading contractors, the Richmond Continuous Threaded Lagstud substitutes preparedness for guesswork in planning a job. With a supply of Lagstuds and some miscellaneous Tyscrus on hand, any foreman can quickly and easily assemble a tie to the exact specification. Most versatile of the Richmond Tyscru family, since it can be utilized in scores of combinations with any of the Tyscru products, the Continuous Threaded Lagstud has been used for emergency bolt requirements, for adjustable anchorages in rock or concrete, or—with Lagnuts—for bolting forms together.

The accompanying diagrams illustrate the adaptability of the Richmond Continuous Threaded Lagstud. They are available in ½", ¾", 1" and 1¼" diameters, threaded to fit the contour of the helix coil of the Tyscru.



Safe load rating is equal to that of Tyscrus of the same diameter. Obtainable in 5'-0" standard lengths or cut to length as required.

The entire Richmond Adjustable Tyscru System—Adjustable Tyscrus, Continuous Threaded Lagstuds, Lagnuts and Handle Lagnuts—is described in the 1955 Richmond Catalogue. Write for your copy. Or if you have specific concreting problems Richmond's Technical Division or field men will be glad to lend a hand. Write: RICHMOND SCREW ANCHOR COMPANY, INC.—816 Liberty Ave., Brooklyn 8, N. Y. or 315 South Fourth St., Saint Joseph, Mo.

Speedy Basement Digger Cuts Excavation Costs

LOOK AT THAT LOAD as the INTERNATIONAL DROTT Skid-Shovel uses exclusive Skid-Shoes with pry-out action to apply 11,500 pounds of break-out force to work. The heaped load is retained by 41° bucket roll-back and the paydirt is moved in third gear to the stock pile.

Operator finds INTERNATIONAL DROTT TD-9 Skid-Shovel works faster, handles easier on housing project

The Trowbridge Construction Company, Marshalltown, Iowa, is one of the thousands of contracting firms the country over that has discovered the fastest, most economical way to dig basements is with an INTERNATIONAL DROTT Skid-Shovel.

Here the TD-9 Skid-Shovel is shown starting 75 basement excavations on a new housing project in Marshalltown, and operator Terry Adams says:

"This loader is faster, easier to handle, with plenty of visibility so you can see the work you are doing. It tops all other loaders I've seen."

You'll know what Terry is talking about when you call your INTERNATIONAL Industrial Power Distributor for your demonstration. There are four sizes of Skid-Shovels—⅞, 1¼, 2 and 3 cu. yds.—and they all have Skid-Shoes and use pry-out action to supply 300% greater break-out force. Loading force is transmitted into the ground and the units transport heaped loads at ground level in high gear to speed every cycle. Call today for your demonstration and see how they'll cut your excavation costs.

FULL HEAPED LOAD is retained during transport and dumped on the stock pile without spillage. The highest lift, farthest pitch feature pays off big for loading out haul trucks with high bodies.

INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

(Advertisement)

FOUR ROUNDS PER SHIFT!

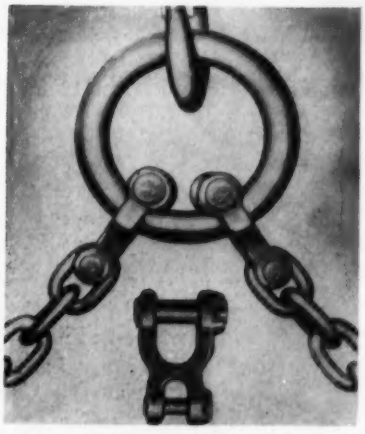
Peak production on 8-ft diameter bore under Niagara River is achieved by experienced crew of Herbert F. Darling, Williamsville, N. Y. contractor. 5,800-ft tunnel will carry Niagara water to town of Tonawanda. Swing shift has drilled, shot and mucked four rounds in 7 hours! Four man crew, with two JR-38As and Carset Jackbits, drills and loads 23-hole, 6-ft round in 55 min. Super on job credits fast drilling to use of Ingersoll-Rand JR-38A Jackdrills — lightweight and easy to handle.

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.

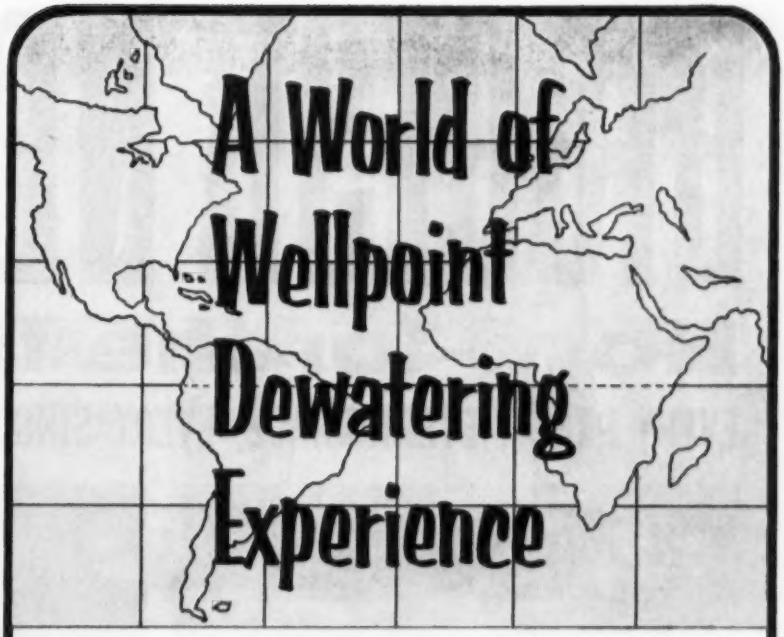
5-224

EQUIPMENT NEWS . . . Continued

PROPANE FUEL FOR FLOODLIGHT—The Tilley floodlight which in the past has been available only in a kerosene-burning model can now be converted to use propane fuel, thereby eliminating pumping, since propane tanks deliver fuel at a constant pressure. Another advantage is that the new fuel will not blacken the reflector. Also, propane permits use of the lights in temperatures as low as minus 45 deg. Further, a 20-lb tank of the gas provides a 5,000 reflected cp light for 47 hr. Users may convert present lights by obtaining a conversion kit from manufacturer. Principal items in kit are valve, regulator, hose and bracket. The changeover can be completed in about 5 min.—**William W. Lee & Son, 20 E. Jackson Blvd., Chicago 4, Ill.**



CONNECTING LINKS—This connecting link, called a double clevis link, consists of two clevises joined back-to-back with pins heat-treated for extra strength. It is made for chain sizes ½, ¼, 5/16, ⅜, 7/16 in. All that is required to make slings and hitches in the field with this product is a pair of pliers or a screw driver.—**The Thomas Laughlin Co., Portland, Me.**



Serving the World's Leading Contractors

Wherever you go . . . to the four corners of the globe . . . Foundation Equipment's Wellpoint Pumping Systems are establishing records for economical and dependable performance for the world's leading contractors.

Engineered and installed by construction men with over 26 years of practical experience in all phases of dewatering, each Foundation Wellpoint System is designed for exact job requirements.

Write today for literature and complete information on Foundation's money-saving, "pre-bid service" for contractors.

Engineered by Millars, London, England	Engineered by Foundation, New York, N. Y.
GEORGE WIMPEY AND COMPANY, LTD. Steel Company of South Wales, Ltd. Abbey Works, Port Talbot, South Wales	**FITZ SIMONS & CONNELL DREDGE & DOCK COMPANY** Rail to Water Transfer Corporation Project Chicago, Illinois
CORPORATION OF BRIDGEWATER Deep Sewers in Boiling Silt Bridgewater, Somerset, England	**TURNER CONSTRUCTION COMPANY AND CAMPBELL BUILDING COMPANY, INC.** I.B.M. Project Kingston, New York
CORPORATION OF PORT TALBOT New Town Constructed on Sand Dunes Port Talbot, South Wales	**JOHNSON-GREENE COMPANY** Ohio Turnpike Project Holland, Ohio
COUNTY BOROUGH OF BOURNEMOUTH Sewerage Works Reconstruction Bournemouth, Hampshire, England	**GAINES CONSTRUCTION COMPANY** Sewers and Sewage Treatment Plant Opa Locka, Florida

FOUNDATION EQUIPMENT CORP.

Long Island City 1, N. Y. • Chicago, Illinois

Overseas Associates

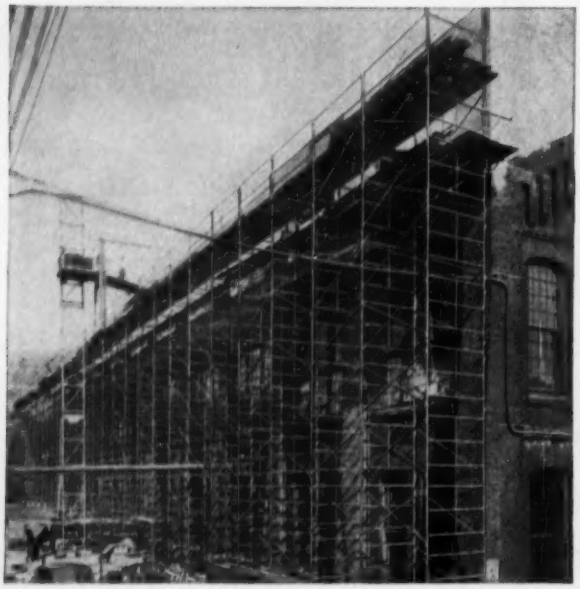
MILLARS' MACHINERY COMPANY, LIMITED — LONDON, ENGLAND

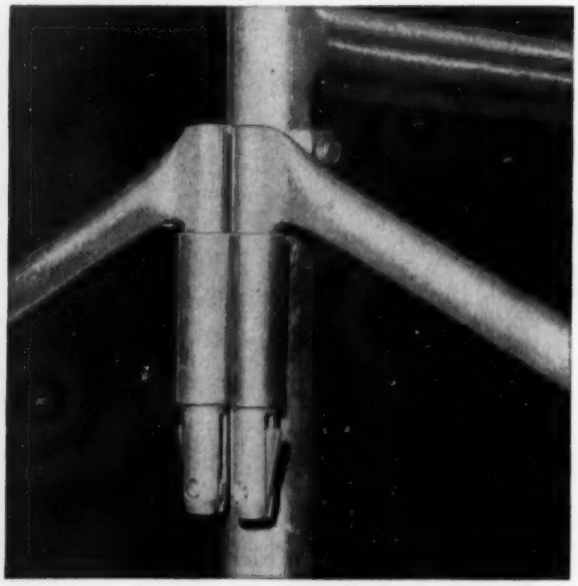
Branches: South Africa, Australia, India, Egypt, Spain, France, Malaya

BIGGEST NEWS IN

Now—for the first time

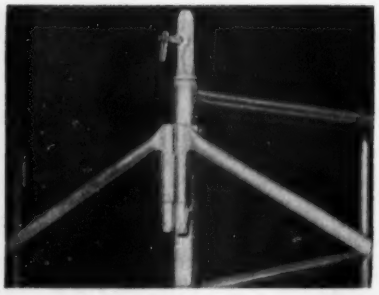
EVERY PANEL, EVERY BRACE, EVERY SINGLE COMPONENT PART OF



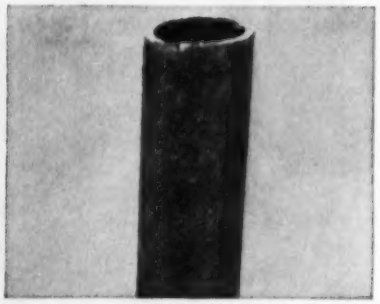


NO MORE RUSTING—Your scaffold will work faster, look better on the job, and definitely last longer

No More Pitting—Gone are the curses of rust-pits that eat into scaffold steel. Construction men and mason contractors well know how these rusted, rough surfaces slow down erecting and dismantling. Now, Universal's protecting galvanized surface assures faster operations and cleaner-looking scaffolding.



Rust-Free, Lubricated Surfaces—The smooth surface that galvanizing provides, acts as a lubricant when fitting braces and connections. Further, mortar won't cling as readily to cleaner-surface zinc galvanizing—and your Universal Scaffold will constantly work better to give you more job profits.



No Costly Rust Deterioration—The galvanized surface on every part of Universal Scaffolding provides a lasting protection that will greatly lower your maintenance and reconditioning costs. Since rust and corrosion are eliminated, the life of your Universal scaffold on the jobs will be multiplied many times.

SEE YOUR LOCAL UNIVERSAL DISTRIBUTOR FOR IMMEDIATE DELIVERIES

SCAFFOLD HISTORY

AT NO EXTRA COST!

UNIVERSAL SCAFFOLDING—INCLUDING THE FAMOUS "GRAVITY-LOCK"

THE MOST WANTED AND MOST NEEDED IMPROVEMENT IN THE INDUSTRY!
A LUBRICATING GALVANIZED SURFACE THAT PROTECTS AGAINST THE HARMFUL WORK-DETERRING ACTION OF RUST—TO SPEED UP ALL YOUR SCAFFOLD WORK.

Here, at last, is the wonderful result of long experimental research, to bring to scaffold users all the benefits of zinc galvanizing—at no increase in cost. It is bound to be welcomed as a most important contribution to the construction industry. Universal Manufacturing Corporation, world's largest producer of steel-panel scaffolding, is now applying on every single component of Universal Scaffolding, a perfected zinc-galvanizing that provides a clean, smooth, rust-preventive and lubricative surface.

At last, RUST, the age-old curse of the scaffold business is satisfactorily disposed of—once and for all.

How does this benefit you, the scaffold user? It simply means that the harmful effects of rust and corroded rough surfaces will no longer slow down your scaffold erection and dismantling. It means that you can count on substantial reductions in the costly recurring expenses of maintaining and reconditioning your scaffold. It means your scaffolding will work faster, look better on the job, and last longer. In short, with this important new development, ***you can now count on more profits.***

We welcome inquiries from scaffold users in seawater coastal areas, or in chemical installations, where corrosion is an important consideration.

Investigate today—see your local Universal distributor who can arrange for immediate deliveries.

Send for free Literature on:
EZEBILT & LADSCAF
Steel-Panel Scaffolding
AMERICAN-TUBULAR
Elevating Towers
AMERICAN-UNIVERSAL
Safe-Seating Bleachers

Another Important "FIRST" by the Pioneers of the Only Automatic-Locking Brace—"Gravity-Lock"

UNIVERSAL MANUFACTURING CORP.

"World's Largest Producer of Steel-Panel Scaffolding"
ZELIENOPLE 12, PA.

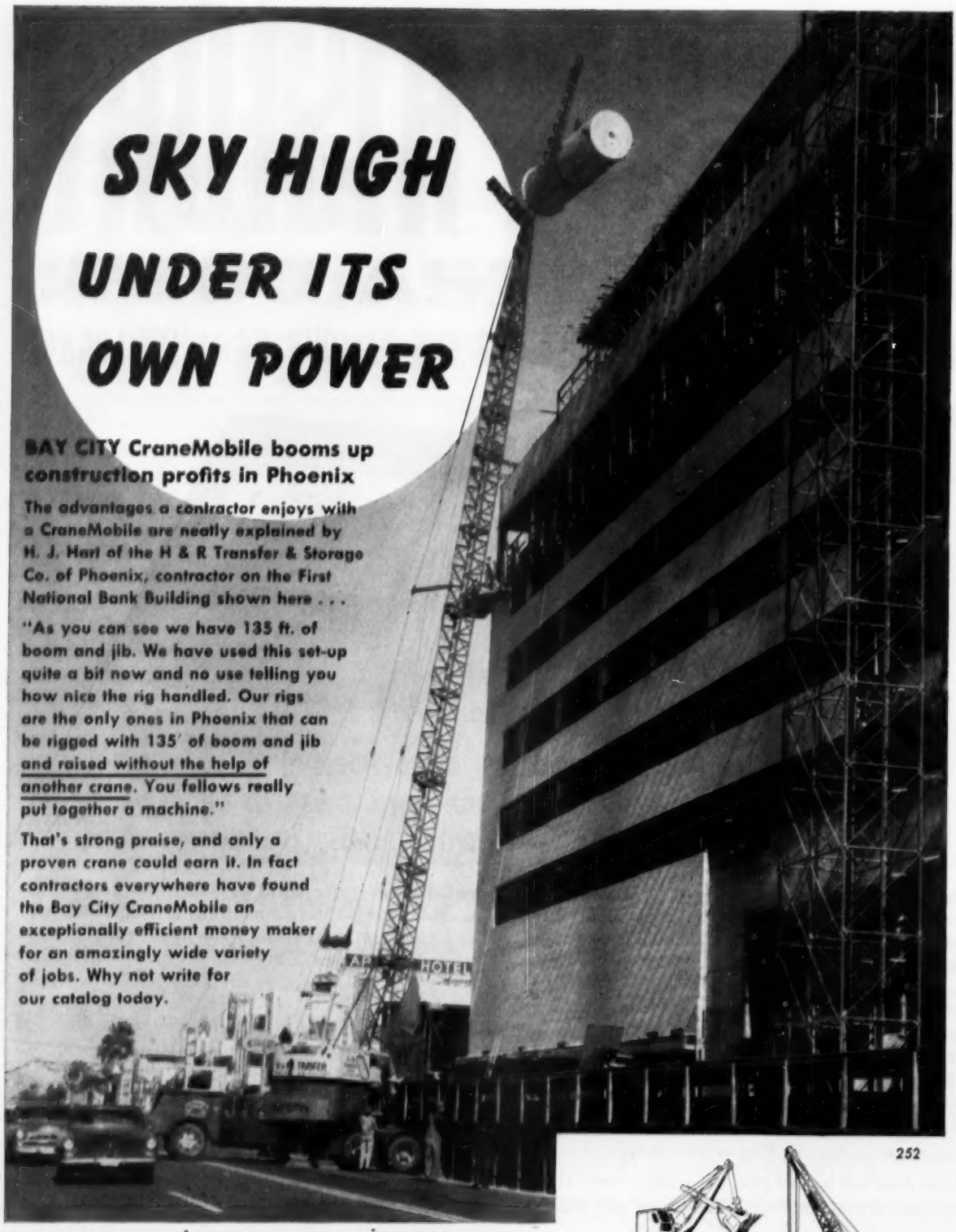
SKY HIGH UNDER ITS OWN POWER

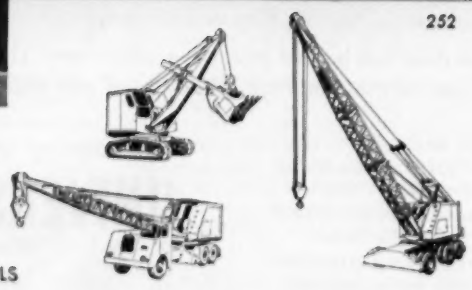
BAY CITY CraneMobile booms up construction profits in Phoenix

The advantages a contractor enjoys with a CraneMobile are neatly explained by H. J. Hart of the H & R Transfer & Storage Co. of Phoenix, contractor on the First National Bank Building shown here . . .

"As you can see we have 135 ft. of boom and jib. We have used this set-up quite a bit now and no use telling you how nice the rig handled. Our rigs are the only ones in Phoenix that can be rigged with 135' of boom and jib and raised without the help of another crane. You fellows really put together a machine."

That's strong praise, and only a proven crane could earn it. In fact contractors everywhere have found the Bay City CraneMobile an exceptionally efficient money maker for an amazingly wide variety of jobs. Why not write for our catalog today.





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BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

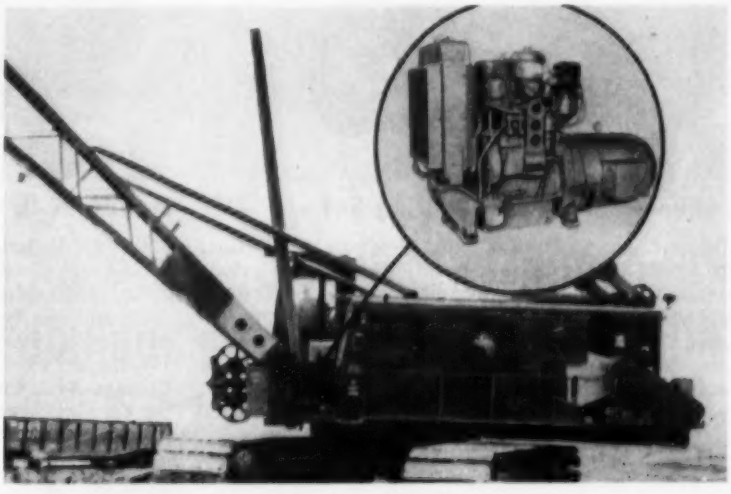
POWER PLANTS . . . Continued

Need Job-Site Power?

• On every type of construction, whether a new skyscraper, a super-highway, a bridge or a ranch-type home, the one thing working for you every day is electric power. Power tools, whether a hand drill, a saw or a concrete vibrator have one thing in common. They are using electric power to do a job for you faster, easier and probably more economically. There are more than 100 firms producing diesel and gasoline-driven generating sets today. They are manufactured in all sizes, shapes and forms for every conceivable construction installation. Here are just a few of the latest models released.

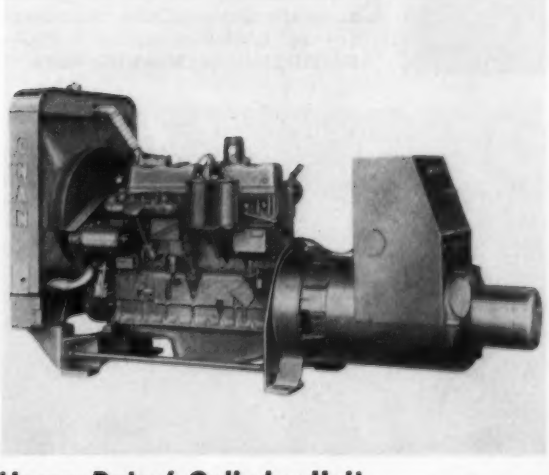
Lightweight Generator

Light enough to be carried by one man, this mighty midget puts out 1.5 kw. A 4-cycle, direct-drive, 3-hp gasoline engine powers it. Available dc (97 lb) and ac (107 lb). — **Master Vibrator Co., 262 Stanley Ave., Dayton, Ohio.**



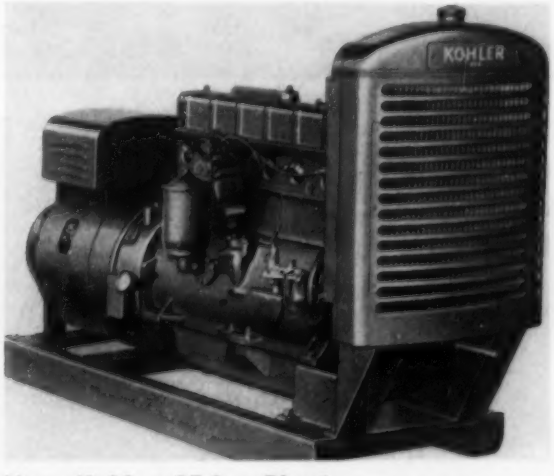
Auxiliary Power for Working Machines

The Model 17, latest addition to the Sheppard line of diesel generators and power units, is designed for mounting as an auxiliary on cranes, power shovels, draglines, and similar equipment where space is at a premium. It is also available as a stationary installation with a complete sheet metal enclosure for use out-of-doors at exposed locations. The Model 17 develops 5 to 7½ kw, and is powered by a 20-hp diesel engine.—**R. H. Sheppard Co., Hanover, Pa.**



Heavy-Duty 6-Cylinder Unit

Designated the 75 HR, this big brother of the Onan line is rated at 75 kw, 93.75 kva. The machine is powered by a Continental 155-hp engine. The gasoline-engine driven units produce either 75 kw of 60-cycle ac at 1,800 rpm, or 60 kw of 50-cycle ac at 1,500 rpm. Net weight is 3,715 lb.—**D. W. Onan and Sons, Inc., Minneapolis 14, Minn.**

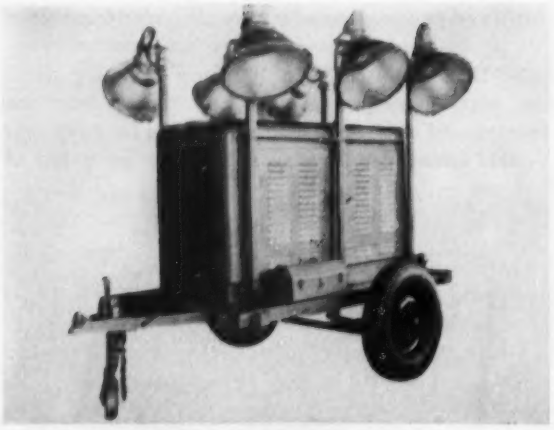


New Kohler 15-kw Plant

Available in six different models with remote control or stand-by starting, and with varying voltage outputs, the new plant is powered by a 51-hp, 6 cylinder engine and water-cooled with a large radiator. It produces ac power at 115, 230, 115/230 and 120/208v —one- and three-phase systems.—**Kohler Co., Kohler, Wisconsin.**

(More Power Plants on next page)

One of the heavy-duty, go-any-

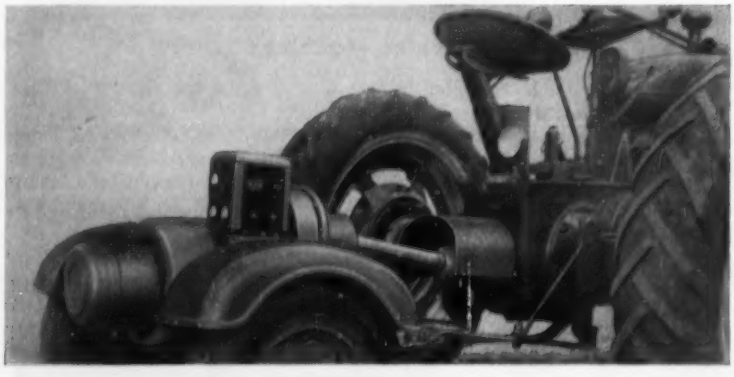


Trailer-Mounted Generating Set

Fitted out as a lighting unit in the above installation, this 10-kw U. S. engine generating set also provides receptacles for the operation of power tools. The six 1,500 watt lamps may be removed and spotted, as required. The trailer mount allows the unit to be moved to any point where light or power is required.—**U. S. Motors Corp., Oshkosh, Wis.**

Handy 75-lb Generator

Mall's IMA Generator, a 1-kw power plant, can be hand-carried wherever it is needed. This 120-v, 60-cycle, single-phase ac unit develops 8 amp at 3,600 rpm, and has two double-prong outlets. The unit is powered by the model 2 MG engine, a 5-hp, 2-cycle, 1-cylinder gasoline unit.—**Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill.**



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Tractor-Mounted Power Unit

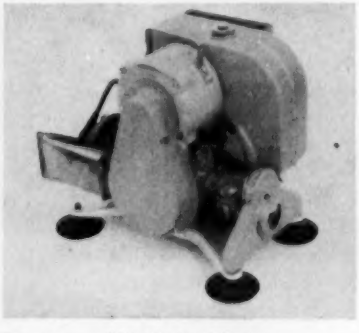
Easily attached and driven directly from the power take-off of farm type of tractor, this new Katolight generator is available in sizes from 5 to 25 kw. Capable of continuous service, the units are of revolving field type with good overload and motor-starting ability. The generators are also available as stationary or trailer mounted units.—**Katolight Corp., Mankato, Minn.**

Lightweight ac Plant

The Hamco 350-D, a 3,500-w unit, 115/230 v ac, 60 cycles, will take a starting load of 5,000 w. Its total weight is only 210 lb. The 350-D has been designed for rapid repair.—**Hamden Machine Products Inc., 44 Kendall St., New Haven, Conn.**

Small Onan Generators

A complete new line of small engine-driven electric generating plants ranging from 500 to 2,500 w is announced by Onan. Called the AK series for 500 and 750 w, and AJ for 1,000 and 2,500 w.—**D. W. Onan & Sons, Minneapolis, Minn.**



Bantam-Weight Unit

Weighing only 30 lb, the Lear Model 5900-B is a self-contained generator which supplies 50 amp at 26 v continuously. Has a carrying handle and suction cup feet to prevent shifting.—**Lear, Inc., 3171 S. Bundy Dr., Santa Monica, Calif.**

One of the heavy-duty, go-anywhere, Portable Service Stations in use on the Orinoco project. Note variety of lubricants pumped, separate power supply, lights for around the clock operation.

Link-Belt Company Photo

Here's how Alemite Portable Service Stations help...

Speed iron ore on its way...6,000 tons per hour—all the way from fabulous Orinoco to Philadelphia!

The discovery of an important iron ore deposit at Cerro Bolivar in Venezuela, was just the beginning of a vast engineering project without parallel in history. A 90-mile ore gathering system was built to an ore conditioning plant at a river loading point. 178 miles of channel were dredged to tidewater. A mammoth handling, storing, shipment installation all designed to bring high-grade ore from Venezuela to mills in the U.S.A.—*fast!*

Miles of mine tracks, conveyor belts, processing equipment, shiploading facilities—and thousands upon thousands of bearings—bearings operating under the most difficult conditions of dirt, grit—and tested by close demanding schedules that admit no downtime for any reason.

Yet, lubrication facilities at this remote iron ore source, under these difficult conditions, are as complete, in the protection they offer, as those at the finest service station or car dealer in Philadelphia. The answer is Alemite Portable Service Stations.

These portable units take lubrication where it is needed, right to machines and mining rigs. Pumps, hose reels, etc., are mounted directly on truck beds. The result is a complete, self-powered maintenance department ready to go anywhere. These three benefits are the immediate result:

1. Save Time! By bringing complete power lubrication to all equipment on the job—safely—efficiently.

2. Save Money! By cutting expensive lubrication downtime—increasing output of both men and machines.

3. Save Equipment! By greatly reducing the possibility of costly, time-consuming bearing failure.

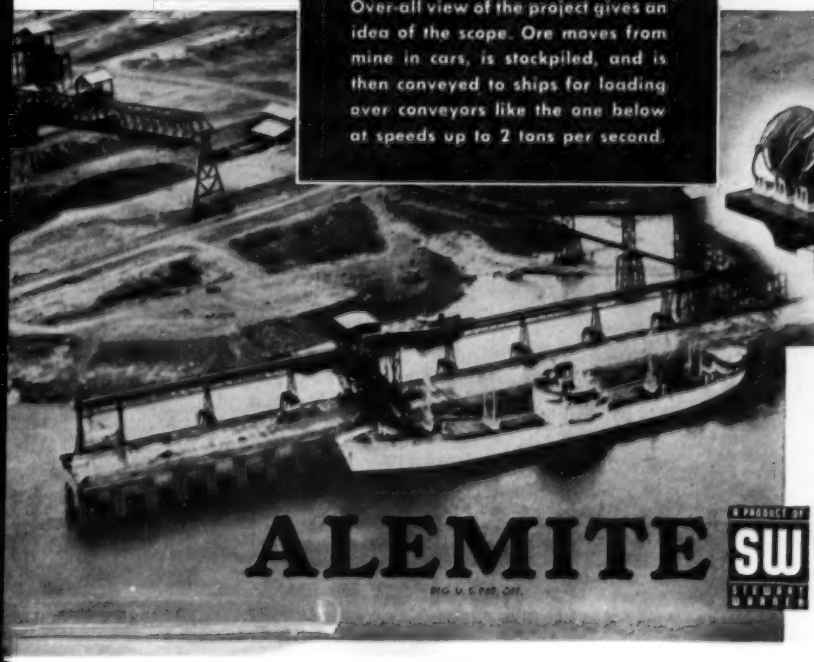
Alemite Portable Service Stations
Offer These Four Services

Fast, easy lubrication of track rollers and fittings

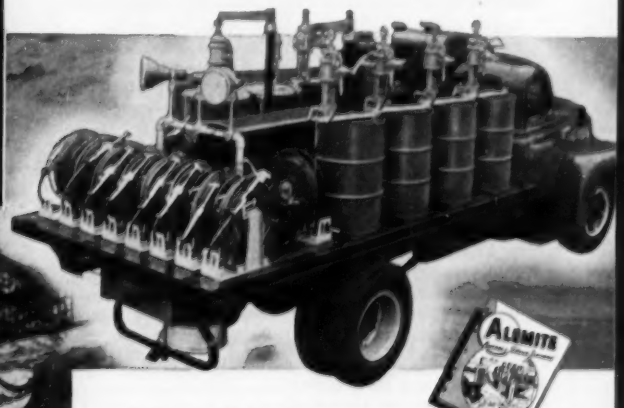
No oil wasted—use exact amount of lubrication required

Quick fillings of gear housings, transmissions, final drives

Air line equipment for tire inflating, air jet cleaning



Over-all view of the project gives an idea of the scope. Ore moves from mine in cars, is stockpiled, and is then conveyed to ships for loading over conveyors like the one below at speeds up to 2 tons per second.



ALEMITE REG. U. S. PAT. OFF.

A PRODUCT OF SW STEWART-WARNER

Alemite, Dept. F-55, 1850 Diversey Parkway
Chicago 14, Illinois

Gentlemen: Please send me your FREE illustrated booklet containing complete information on Alemite Portable Service Stations and Alemite equipment.

Name .....

Company .....

Address .....

City ..... State .....

ROK·BITS® at Monticello Dam

The stripping operation, at this northern California dam site, is another important project where carbide Rok-Bits and Brunner & Lay drill steel were used—1⅝, 1¾, 1⅞ and 2-in. four-point Rok-Bits on Brunner & Lay 1¼" round steel. Rok-Bits and B & L drill rods are specified everywhere by men who know their drilling cost. Join them! For details, write plant nearest you.

Carbide Rok-Bits—cross or chisel—gage sizes; 1¼" thru 4". Request Bulletin B-1.

Faces and names on the Monticello job—left to right—Geo. Keyes; Excavating Super.; Waldon Lowe; Paul Holton; Doug Baker, Gen'l Supt., Clarke Hestmark; Sherm Watson of Peter Kiewit Son's Co. & Parish Bros.

Brunner & Lay Products

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.

Brunner & Lay Rock Bit Corp., 2514 E. Cumberland St., Philadelphia 25, Pa.

Brunner & Lay Incorporated, 2425 East 37th St., Los Angeles 58, Calif.

Brunner & Lay, Inc., 150 Leslie St., Dallas, Texas

Brunner & Lay Rock Bit Corp., Sweeten Creek Rd., Asheville, N.C.

Brunner & Lay Corp., 600 N. Tillamook St., Portland 12, Ore.

Speed Up your work! Arc Welding does it BETTER at LESS COST

Speed up your work and cut welding costs with Hobart Gas Engine Drive Arc Welders. You'll avoid time-consuming breakdowns that delay the job and roll up the costs. They can be used anywhere to fabricate steel or repair and maintain equipment. No need for power—they provide their own. And there's a type and size for every construction job.

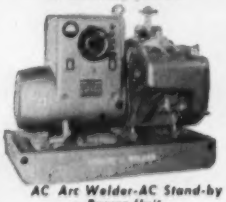
For extra heavy duty welding, contractors favor the Hobart DC Gas Drive Welders ranging up to 600-ampere capacity, with many combinations of auxiliary power.

Others like the combination AC Arc Welder and AC Stand-by Power Unit. Welds or powers lights, tools.

Many contractors are standardizing on the 250-amp "Contractor Special." A full capacity 250-ampere welder, compact and lightweight for easy moving from job to job.

Yes, Hobart has an arc welder for every application—check and return the coupon today for complete details!

Heavy Duty Gas Drive DC Arc Welder with many combinations of auxiliary power.



AC Arc Welder-AC Stand-by Power Unit.

"Contractor Special" Arc Welder.

HOBART TROY OHIO WELDERS

Tear off and MAIL TODAY!

● HOBART BROTHERS CO., Box 655 Troy, Ohio, U.S.A. Telephone 21223

Without obligation, please send information on items checked.

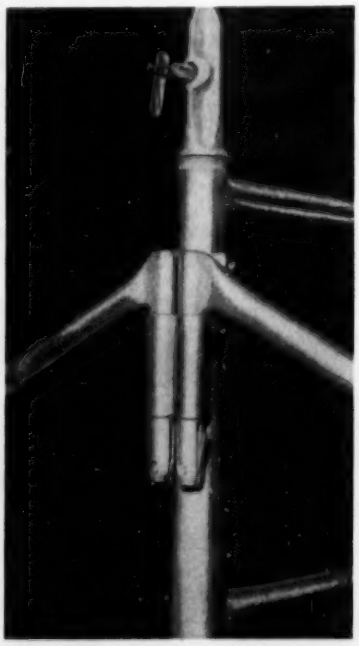
☐ DC Gas Drive Welders ☐ AC Arc Welder-AC Power Unit
☐ "Contractor Special" ☐ Electrode samples for_____

NAME_____ POSITION_____

FIRM_____

ADDRESS_____

WORK BOAT—Developed for work on some of the roughest water in the country—the Mackinac Straits—the Sea Truck, an all-welded utility boat, has proved so successful that the manufacturer has gone into general production with it. Constructed of 3/16-in. steel plate, they are powered by a diesel engine. The boats measure 40 ft in length with a 12-ft beam. According to the manufacturer, they are light enough to be handled in and out of the water by standard job-size cranes and can be transported by trailer or truck.—**Hans Hansen Welding Co., 318 Washington St., Toledo 4, Ohio.**



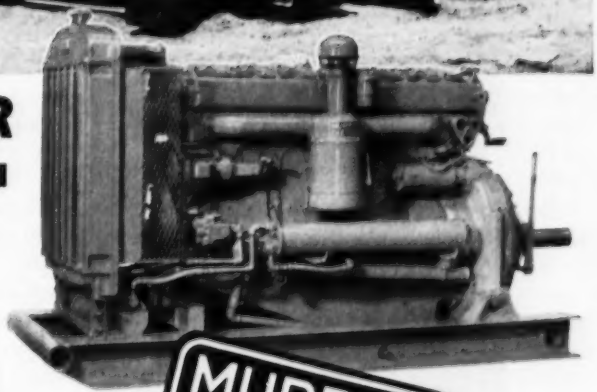
GALVANIZED SCAFFOLDING—In order to prevent rust, all Universal Ezebilt Scaffolding shipped after May 1st will be galvanized at no extra cost. The manufacturer claims that the lubricating quality of the galvanized coating will speed up fitting work in scaffold erection and dismantling.—**Universal Mfg. Co., Zelienople, Pa.**

MURPHY DIESEL POWER

your key to more economical asphalt plant operation

There are a lot of factors that determine how profitable your asphalt operations will be. Some you can control—others you can't. But you can do something about power for your plant. You can use an engine that's dependable under all conditions, economical on fuel and maintenance, rugged and capable of delivering the kind of power you need. One engine fills this bill—the Murphy Diesel.

Murphy Diesel offers three types of power to best suit your needs—mechanical power units, electric generating sets and Mech-Elec Units which will supply both mechanical and electrical power separately or simultaneously. Ask your Murphy Diesel Dealer to give you complete information on the unit that will serve you best.



MURPHY DIESEL COMPANY
5337 W. Burnham St.
Milwaukee 14, Wisconsin
Sales, parts and service throughout the nation

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Heavy duty power
for construction
Murphy Diesel Engines and Power Units for construction, 90 to 240 H.P. Generator Sets, 60 to 154 K.W.

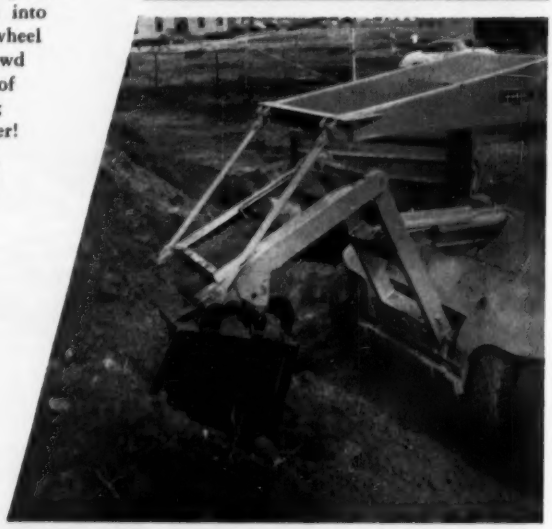
(Advertisement)

Dempster-Diggster bucket GETS A FULL LOAD WITH EVERY STROKE!

The hydraulic crowd and hoist operation of the new Dempster-Diggster GRD-101 gives you big shovel advantages in front end loading and excavation work. As shown in the at-work photos at right, here's what happens: Dempster-Diggster moves into material with shovel lowered against front of frame. No wheel traction is used to get excavation power. The hydraulic crowd and hoist moves bucket out and up following contour of material—getting a full bucket with every stroke . . . reducing loading time and idle truck time, thus getting the job done faster!

When you put your Dempster-Diggster into operation, one of the first things you will find is that your entire operation must be geared to a faster pace. This means greater efficiency of equipment and manpower—more profit to you!

Write us asking for Folder No. 3116 giving you complete information on the features of the Dempster-Diggster, including TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MAXIMUM DUMPING AND DIGGING HEIGHT . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING, etc. Manufactured by Dempster Brothers, Inc.



In photo below camera catches Dempster-Diggster ready to back off and move up to a truck for loading.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS 355 SHEA BLDG., KNOXVILLE 17, TENN.

(7) polishing metal or wood; (8) drilling in wood, metal or concrete;

WATER CAN—A new water can and cooler line is now available, featuring a special galvanized material. The new galvanize is electrolytically bonded to the metal and does not flake away to cause early rusting and deterioration of an otherwise sound can. Soldered and sealed throughout for guaranteed vacuum-tight construction, which provides dead-air insulation for colder water longer, the advanced design also insures perfect fitting of the lids. Available in four sizes—1½, 2, 3 and 5 gal, either with or without Fiberglas insulation and semi-recessed faucets.—**Acton Manufacturing Co., Inc., 605 S. Summit St., Arkansas City, Kan.**

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ACCURACY AND QUALITY

PERFECTED THROUGH 102 YEARS

"NITAC" — World's only level with split bubble, erect image. One of many super-fine levels, transits, theodolites, made by Fennel's old-world craftsmen. Performance-proved in 58 countries. Send for particulars, prices.

FENNEL INSTRUMENT CORP. OF AMERICA

11-27 44th Rd., Long Island City, N. Y.

Dealers in principal cities

(Advertisement)

Setting steel tunnel supports with hydraulic jacks saves time and money...

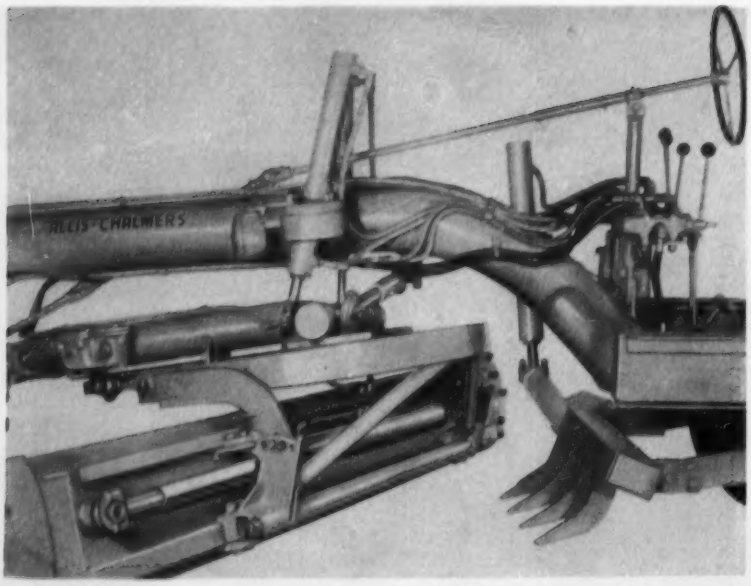
• **What's Going On Here?**—Look how these heavy steel crown rib tunnel segments are raised and held in exact position with 20-ton hydraulic jacks until the complete rib is in place and bolted together. One man governs the action of these jacks by operating remote control valves. If unstable ground conditions should be encountered another set of jacks can be quickly set up to provide immediate support to the roof, sides and face until the next rib can be advanced and set. Spacer angles bolted between the ribs locate and tie the ribs together into a composite labyrinth. Shallow-depth formed steel lagging plates bolted to the outside of the ribs furnish protection from spalls and provide a surface to support back packing.

• **What This Means for You**—Using the hydraulic jack method requires fewer men in the erection crew and ribs are set into place faster—erection cost is less. Erection equipment takes up less space because these jacks telescope into such a low shut height in their closed position and space in the heading of a tunnel is really at a premium. No stoppage in the mucking operation is necessary while the bore of this tunnel is being trimmed and the steel supports set. The whole cycle in driving and supporting the heading is speeded up and this means additional savings.

"Commercial", with a background of years of experience, designs and furnishes complete tunnel support systems using the strength of steel in its most efficient treatment. No matter which steel tunnel support products are recommended—ribs, lagging, spacer angles, wall posts and beams, liner plates, hydraulic jacks—because they are all made by "Commercial" you may be sure of a system that gives you the lowest cost benefit of every ton of steel used.

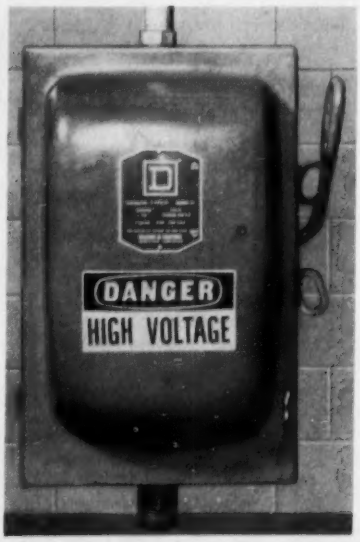
The Commercial Shearing and Stamping Company, Youngstown, Ohio—Chicago, Ill.—Salt Lake City, Utah.

COMMERCIAL
shearing and stamping



HYDRAULIC MOLDBOARD—A hydraulic shiftable moldboard, an additional accessory for the A-C Model D motor grader, is similar in design to the hydraulic moldboard of the AD-40 motor grader and permits a side shift of 16 in. right or left—a total of 32 in. The blade can be shifted from the operator's seat. This mold-board is advantageous when working around guard rails, mail boxes, culverts, buildings, finishing between forms, and other similar operations. When used in conjunction with the TLD shoulder maintainer, the power-shift moldboard speeds shoulder maintenance as it permits work around various obstructions.—**Allis-Chalmers Manufacturing Co., Milwaukee 1, Wis.**

GASOLINE VIBRATOR—Model 14GV23, a 6-hp vibrator with 7,000 or 10,000 rpm heads speeds, is a new item of equipment for compacting concrete far from any power source. No air compressor or generator is needed. This model can be furnished with a Wisconsin or Briggs & Stratton engine. It has a reliable 1-cyl, 4-cycle motor that runs at a moderate 3,600 rpm, reducing wear and tear. A two-step pulley, to regulate speed, comes in two types: one with a 1,200 to 7,000 rpm speed range, the other an 1,800 to 10,000 range. This system puts the right vibrating frequencies at the vibrating head while allowing the engine itself to operate at a lower, life-saving speed. The engine has an automatic centrifugal-type clutch for idling. Shafting is supplied in 7-ft interchangeable lengths. The machine will handle three, four or more lengths at once. If the shaft or housing is damaged, only one 7-ft length has to be replaced. A male pipe thread detail with which the flexible shaft housing is equipped, forms an automatically tight seal. The housing is highly resistant to abrasion and cuts. A number of other features gives it a claim to unequalled versatility. By removing the head, reducing the shafting to the desired length, and adding an adapter shaft, housing, and spindle, contractors can use it for: (1) dry grinding concrete; (2) wet rubbing concrete; (3) grinding welds; (4) removing rust with wire brush; (5) sanding metal or wood; (6) surface or edge grinding of metal; (7) polishing metal or wood; (8) drilling in wood, metal or concrete; (9) terrazzo grinding in flat or core base work; (10) flat grinding wet or dry of metal work such as trunk bodies. By replacing the spindle with a sump pump, contractors can convert the 14GV into a pump that will handle 4,500 gal per hr against a 25-ft head. Such a unit is indispensable for pumping out basements, fighting fires, and opening holes for pilings or footings. This vibrator comes with an air and fuel cleaner, crank starter, 1-gal fuel tank and 3-pint oil case.—**Mall Tool Co., 7725 South Chicago Ave., Chicago 19, Ill.**



SELF-STICKING SIGNS—Accident-prevention signs of this type are available in three standard sizes 5x14 in., 3½x10 in. and 2¼x9 in. Styles include basic purpose signs (example: "DANGER") and specific purpose signs (example: "NO SMOKING"). Either type sign can be used alone or in combination with other signs. Basic purpose accident prevention signs include, Danger, Caution, Information, Directional, Safety Instruction and Radiation Hazard Signs in wordings and colors specified by American Standards Association Std. Z-35.1-1941.—**W. H. Brady Co., 727 W. Glendale Avenue, Milwaukee 12, Wis.**

DYNAMITE CARTRIDGES — New time- and labor-saving "king-size" Hercules cartridges are now available in these lengths: 24, 20, 16, and 12 in. The diameters are: 1¼, 1½, 1¾ and 2 in. The conventional 8-in. cartridge will continue to be available. These cartridges make possible more uniform fragmentation in the deeper blast holes which are being used in mining, quarrying, and construction, and effect substantial savings in time and labor in loading blast holes—**Hercules Powder Co., Wilmington, Del.**

TIGHT SQUEEZE

But Bucyrus-Erie 22-B Transit Crane Makes It Look Easy

This job, located along a narrow, tree-lined residential street in Pasadena, California, required the use of a compact clamshell-crane. A storm sewer trench had to be dug through tough decomposed granite and clay. Then, concrete pipe varying in diameter from 45 to 75 inches had to be installed.

The contractor on the job made the best possible choice: he put a Bucyrus-Erie 22-B Transit Crane to work. Assignments like this are tailor-made for this machine. It's easy to move around with its rubber-tired carrier — can work in tight, narrow quarters. You can use it, as this contractor did, for both excavating and crane work—clamshell, orange peel, and dragline are all operated on the regular crane boom. Above all, it's dependable—a machine you can count on for steady high production every time it starts a job.

Bucyrus-Erie Transit Cranes are available in two sizes — the 15-ton Model 15-B, the 25-ton Model 22-B. Your nearby Bucyrus-Erie distributor can give you complete information.

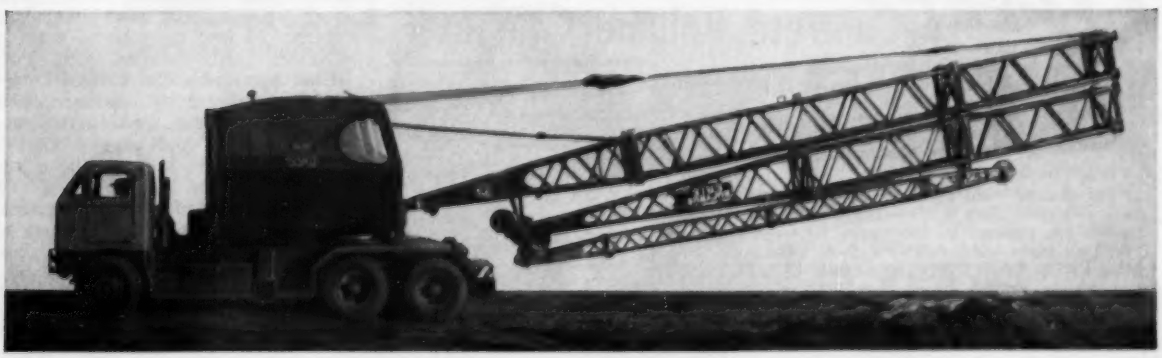
106E55

Power controlled load lowering is one of the features the operator likes best about this 22-B. It helps him set pipe into position quickly and accurately. The job is part of a 10-year flood control project in Los Angeles county.

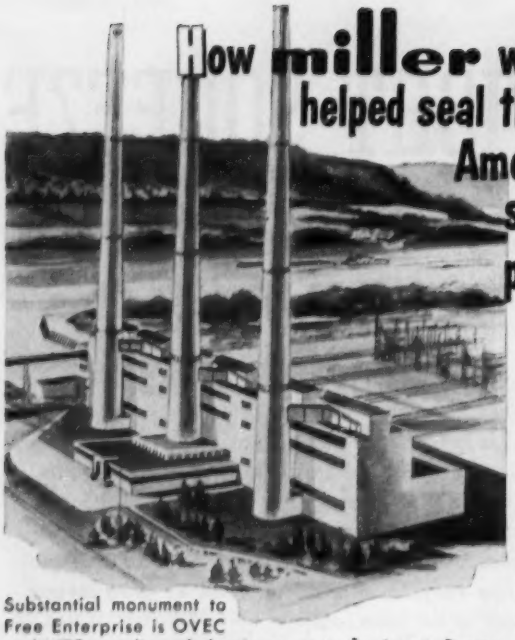
Boom folding mechanism (optional equipment at extra cost) permits crane booms 60 feet and longer to be folded with jib suspended underneath for moves between jobs.

BUCYRUS ERIE

South Milwaukee, Wisconsin



How miller welders helped seal the arteries of America's largest single purpose power plant...



Substantial monument to Free Enterprise is OVEC and IKEC, suppliers of electric power to the Atomic Energy Commission's new uranium diffusion center in Pike County, Ohio.

Ohio Valley Electric Corporation and its subsidiary, Indiana-Kentucky Electric Corporation, agreed to supply electric power to this great new atomic production center . . . *15 billion kilowatt-hours annually.*

Miller Selenium Rectifier d-c Arc Welder, in four wide-range models. For complete, concise, worthwhile information on these and other Miller Arc and Spot Welders, contact us today . . . at no obligation, of course.

Two huge generating stations are being built: The Kyger Creek Plant at Cheshire, Ohio will have five generating units of 200,000 KW each; Madison, Indiana's Clifty Creek plant will produce 1,200,000 KW with its six big generators. Each of the eleven turbo-generating units will operate off a single boiler, with super-heated steam reaching 1,050 degrees Fahrenheit under 2,000 lbs. pressure per square inch! The high temperatures and reheat, which the sponsor companies have pioneered in their own right, will make these two plants among the most economical, most efficient generating stations in the country.

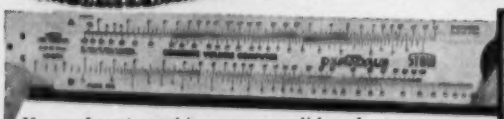
These same elements, however, make the fabrication of faultless high-pressure steam lines vital . . . and extremely difficult. To accomplish this extremely important task, pipe welding specialists equipped with the maximum of engineering skill utilized the Miller Selenium Rectifier d-c Arc Welder.

"... if it's Miller, you know it's the *finest!*"

miller ELECTRIC MANUFACTURING COMPANY, INC.
APPLETON, WISCONSIN

Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P.Q.

FREE! this handy pocket Concrete Volume Computer



Yours for the asking . . . a slide-rule type computer that estimates concrete yardage required for any size slab! Easy to read: thickness and height or width are opposed on the upper scale; yardage is read on lower scale. Ask your Stow Distributor for this FREE CONCRETE VOLUME COMPUTER, or write:

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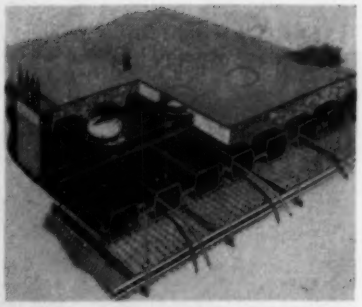
31 Shear St., Binghamton, N. Y.

MODEL AG STOW CONCRETE VIBRATOR

4½ HP 4 cycle air-cooled engine. Delivers 6000-9300 VPM. Available with wheelbarrow mount. Made by Stow, Manufacturers of Roto-Trowels, Concrete Vibrators and Screeds.



CELLULAR SUB-FLOORING—This new cellular flooring permits unlimited electrical outlet flexibility and greater construction speed. Delivered in easy-to-handle sections for quick erection. Because of its combination of high strength and light weight, it provides a strong working surface plus badly needed storage space during construction. The need for wood forms, scaffolding or temporary shoring is eliminated, and smaller footings and lighter structural steel can be used. Electrical outlets can be placed at any location—now or in the future—thus giving complete freedom to any office floor planning.—**American Steel Band Co., Box 565, Pittsburgh 30, Pa.**

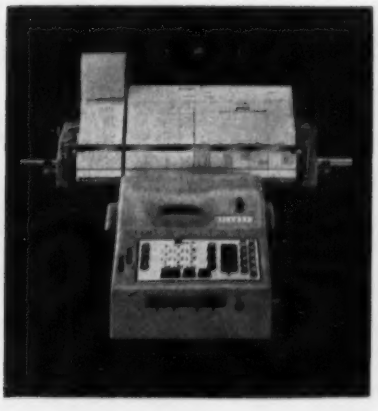
SAFETY LENSES—Optilite lenses, recently introduced to industry and the profession are not a glass, not a thermoplastic, but an entirely new type lens material of compounded resins, designed to give workers what they want in a safety lens—more comfort, better looks and greater protection. They weigh only half as much as safety glass and have approximately twice the strength. —**United States Safety Service Co., Kansas City 6, Mo.**

FOLDING BARRICADES—Recently announced, is a complete line of folding steel barricades from 4 to 10 ft long combining heavy-gage steel top members with steel legs which fold into the tops to provide compact, easily handled units. Two of the barricades can be easily carried and set up by one man. The legs lock in place, making the barricades sturdy and rugged. Carrying handles and lantern hooks are welded into the top members, and holes are provided for attaching electric "flasher" lanterns. Finished in glossy pavement yellow, either plain or striped, the barricades are easy to see under all light conditions.—**All-Craft Mfg. Co., 5035 N. 124th St., Butler, Wis.**

to builders and building suppliers:

The Olivetti Printing Calculator cuts overhead costs by making all figure-work quick, easy, and automatic. The printed tape record can be quickly verified for accurate entry; attached to invoices, payrolls, lumber tallies and other papers; filed; shown to suppliers and customers. Multiplication and division are completely and uniquely automatic. Costs less than, but does the work of, 2 separate machines: a calculator and a fast 10-key adding machine with direct subtraction.

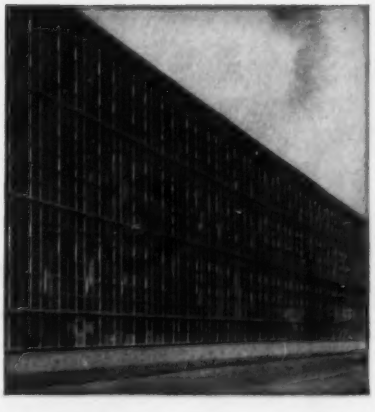
these calculators can help cut your overhead



The Olivetti Automatic Carriage Printing Calculator provides mechanized bookkeeping. It automatically calculates, and prints desired figures on record-forms, automatically moving to the proper columns. It can perform 21 separate operations automatically, in desired sequence; the sequence can be quickly changed. Its platen splits to take a 3-inch tape; it then operates exactly like the Olivetti Printing Calculator (above).

olivetti

The Olivetti Printing Calculator, proved thoroughly dependable in 7 years of commercial use, has a lower cost maintenance contract than any comparable machine. More than 20,000 are on the job in the United States today. They are sold and serviced by 450 Olivetti dealers in every state of the Union, and by Olivetti branch offices; immediate delivery. No spare part is ever more than 24 hours away from any Olivetti dealer. Some of America's great corporations have specified "Olivetti". Why don't *you* investigate work-saving Olivetti machines? Send the coupon.



OLIVETTI CORPORATION OF AMERICA
Dept. DR.
580 Fifth Avenue
New York 36, New York

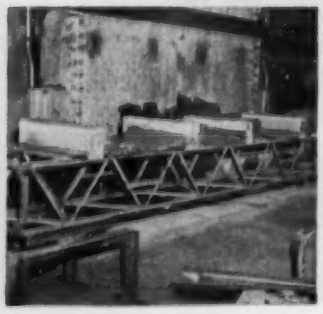
Gentlemen: I'd like to know more about the Olivetti Printing Calculator ( ), the Olivetti Automatic Carriage Printing Calculator ( ), and how they can help cut my overhead. Without obligating me in any way, please let me have this information as soon as possible.

Name.....
Title.....
Company.....
Street.....
City..... State.....

REDUCE HANDLING COSTS.....

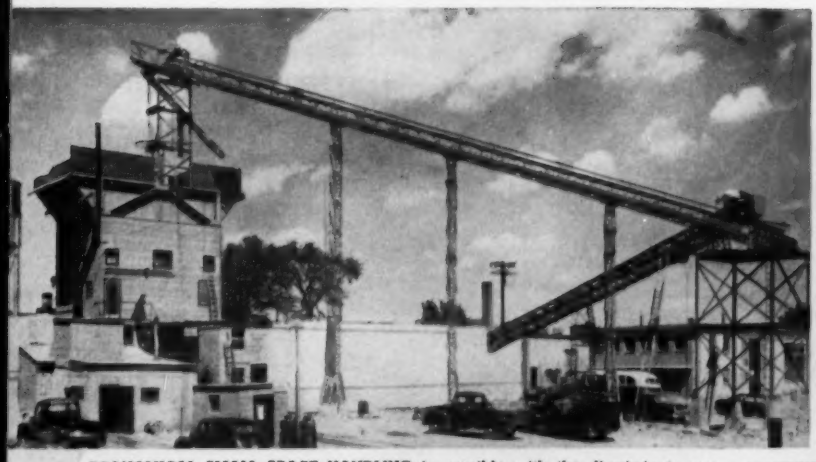
the quickest way to

HELTZEL-OHIO INCLINED AND SHUTTLE CONVEYERS make the handling of vast amounts of materials fast and economical. Before you buy any equipment let Heltzel-Ohio specialists look over your operation and estimate a complete modern day system.



GREATER STRENGTH for LONGER LIFE is the story behind Heltzel-Ohio's special A-frame. Fully stress relieved, most parts are fabricated at the factory under ideal conditions. Unitized, it sets up fast—will last longer.

Thoroughly proved under "back-breaking" loads, every Heltzel-Ohio conveyer section must pass rigid weight tests far in excess of anything it will ever have to carry in the field.



ECONOMICAL SMALL SPACE HANDLING is possible with the discriminate use of switchback conveyers. In a number of cases Heltzel-Ohio engineers have devised 180° or full switchbacks to get maximum use of the space at hand.

TUNNEL CONVEYERS feed from the bottom of the stockpile to cut handling to a minimum. Special Heltzel-Ohio tunnel gates make this system foolproof. Controlled from central panel.

Greater Profits

Heltzel-Ohio Custom Aggregate Handling Systems slash costs for both large and small operators!

ECONOMICAL HANDLING FOR SMALL OPERATORS is a Heltzel-Ohio specialty. Our engineers have cut costs for hundreds of small tonnage operators with simplified, inexpensive, easily controlled systems.

The one place in your operation that you can cut costs without cutting quality is the handling of materials. The research of one leading publication pointed up the fact that 8 out of 10 contractors and yards could realize greater profits simply by bringing their handling equipment up to date.

In a recent check one operator looked over his figures and found it cost him in excess of 28 cents to handle the materials needed for a yard of concrete. He called in Heltzel-Ohio engineers who devised a system that cut this cost to approximately 4 cents a yard. The savings quickly paid for the equipment and now enables him to sell top quality at competitive prices and with much faster service.

Consider your operation. Let a Heltzel-Ohio man show you how modern equipment will pay for itself in short order. How it will put you in the best competitive position possible. And when you think of materials handling, remember Heltzel-Ohio engineers are specialists —designing and building materials-handling equipment specifically for the concrete industry. Get the last word from those who know. Send in the coupon today!

SPECIALISTS IN HANDLING SYSTEMS FOR THE CONCRETE INDUSTRY

HELTZEL *Ohio* **HANDLING SYSTEMS**

Heltzel-Ohio Handling Systems Div. 27000 Thomas Road
Heltzel Steel Form & Iron Co., Warren, Ohio

I'm interested in reviewing my handling operation. I would like to have a Heltzel-Ohio engineer look it over at no obligation.

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15-HP SPECIAL PURPOSE HOIST
single fixed drum, worm gear drive

Meet your hoisting needs *precisely* at lowest possible cost. Call on our long experience in modifying and re-combining standard parts to meet specialized hoisting requirements.

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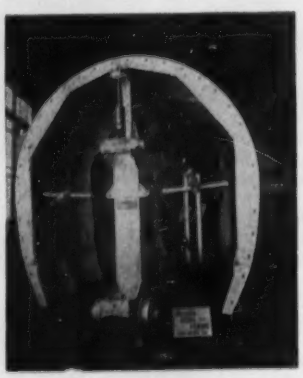

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Mayo produces all types of Tunnel Forms . . . each designed for the exact requirements of the job . . . be it Tunnel, Sewer or Conduit.

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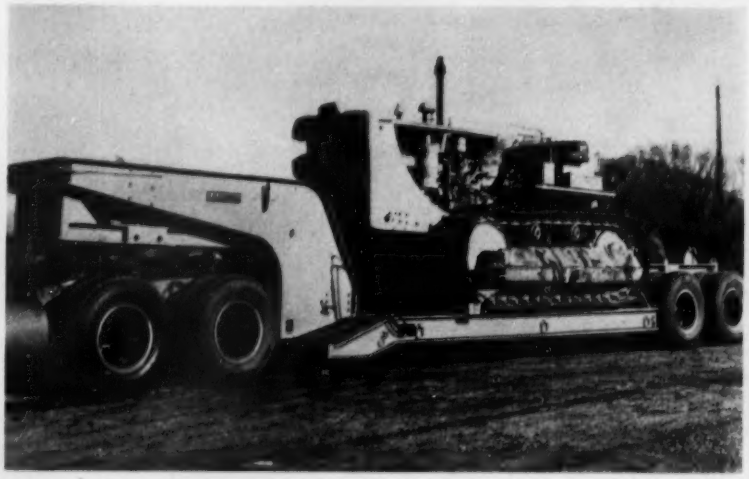
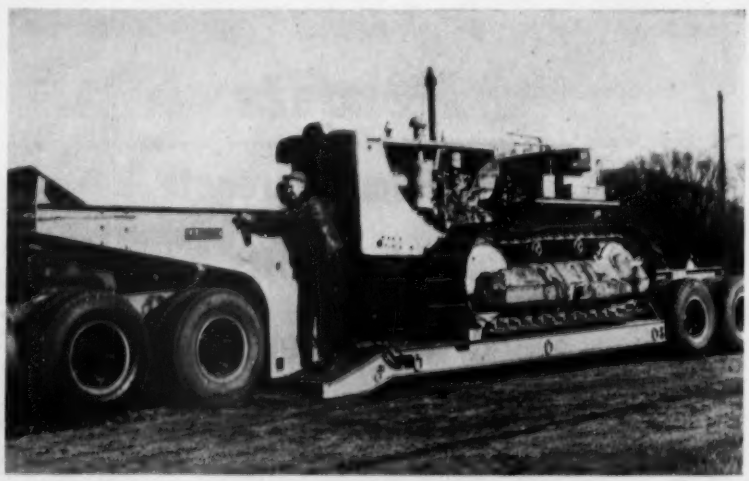


33-TON GOOSENECK TRAILER embodies a number of worth-while features. A powerized gooseneck permits the trailer to be loaded or unloaded by one man without use of skids.



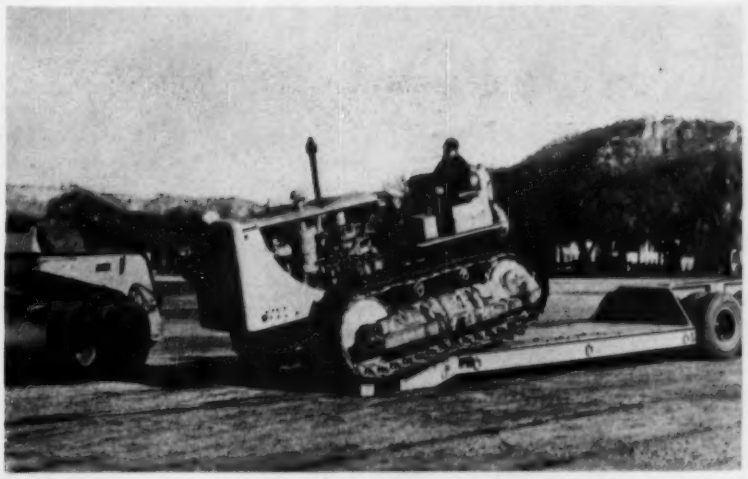
OPERATION OF TRAILER is simple. The driver merely turns a hydraulic lever on the curb side of the gooseneck and the entire platform lowers to a 6-in. height in 1 min.

Trailer's Powered Gooseneck

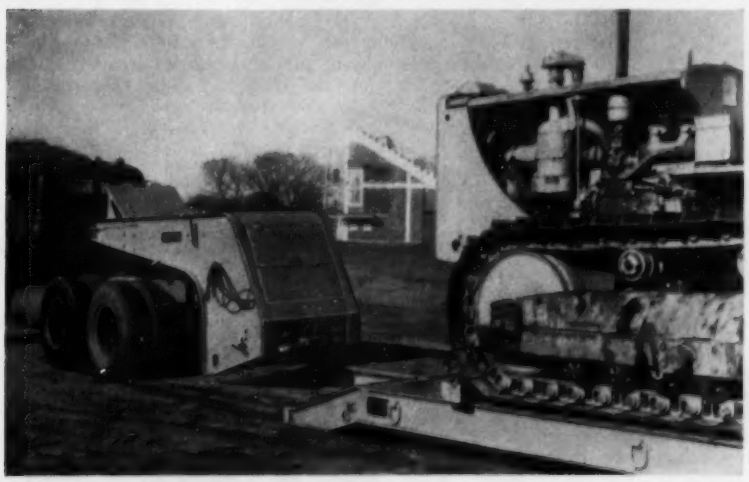
A 33-TON TRAILER featuring one-man operation and a powerful double-acting hydraulic unit in the gooseneck, has been announced by LaCrosse Trailer Corp., La Crosse, Wis. The unit provides fast front-end unloading or loading.

Outstanding feature of the new trailer is a mechanical connection between gooseneck and trailer—a standard inverted fifth wheel in the base of the gooseneck attaches to a standard spring loaded king pin on the front of the trailer platform. Besides providing a dependable hookup easy to line up, and semi-automatic in operation, it also makes the gooseneck a firm controlled part of the tractor. The gooseneck carries a self-contained hydraulic system consisting of a vane-type pump with double-acting cylinders, actuated by a small air-cooled gasoline engine which raises and lowers the trailer platform. It can also be used to raise the rear wheels of the tractor for changing tires or to lower the trailer bed to "stoop" under low wires or underpasses.

Actual operation of the new trailer is quite simple. To unload the trailer the driver merely turns



AFTER PLATFORM IS LOWERED and truck disconnected and driven ahead, the driver unloads equipment over the front end of the trailer. The entire operation takes only 5 min.



SECRET OF SPEED AND SAFETY of the unit is an inverted fifth wheel in the base of the gooseneck which attaches to a spring loaded king pin on front of trailer platform.

Permits One-Man Operation

a hydraulic lever on the curb side of the gooseneck and the trailer platform with built-in ramp is lowered to a 6-in. unloading height in 1 min. The driver next disconnects the air brake hoses, disengages the fifth wheel lock and drives the tractor away. The driver is then ready to drive the equipment off the front end of the trailer. Loading operations are simply a reverse of the unloading cycle.

After being lifted to travel position, the trailer platform is securely locked mechanically by a rigid torque tube and double toggle arm arrangement, entirely independent of the hydraulic system.

The current model, designated as LXC-33D is of 33-ton capacity, spring mounted with 10.00x20, 14-ply tires and an 8x16-ft loading surface. This can be increased to 10-ft widths by extension brackets.

• **Want to reduce machine downtime? Read CM&E's seventh Special Report on Equipment Maintenance, coming in July.**

W.G.B. GIVES YOU A FULL SIZE 750 CUBIC INCH OIL FILTER

One-piece, aircraft-type ring clamp holds top securely. No nuts or bolts to lose or bother with.

Amazing . . . New

W.G.B. 750 CUBIC INCH OIL FILTER uses FULL SIZE (8 x 15) cartridge that can be changed in 3 minutes WITHOUT TOOLS

● **YOU GET** a *full size* 750 cubic inch oil filter when you use W. G. B.--because it's made big enough to use a *full size* (8 x 15) S-11C cartridge. That's why W. G. B. thoroughly cleans more oil faster--and keeps its color clear longer.

● **NO NUTS AND BOLTS**--the new W. G. B. Model WD-2-750 cubic inch Clar-O-fier uses a top that's held securely by a clamp, equipped with a *single hand tightening device.*

● **NO LEAKAGE**--an "O" ring gasket keeps the oil completely locked-in under any operating pressure.

● **QUICKLY INSTALLED**--in most instances fits into the brackets used for any 750 cubic inch filter.

● **FOR BEST RESULTS**--use only the genuine W. G. B. Clar-O-fex Replacement Cartridge (No. S-11C).

APPROVED BY LEADING ENGINE MAKERS

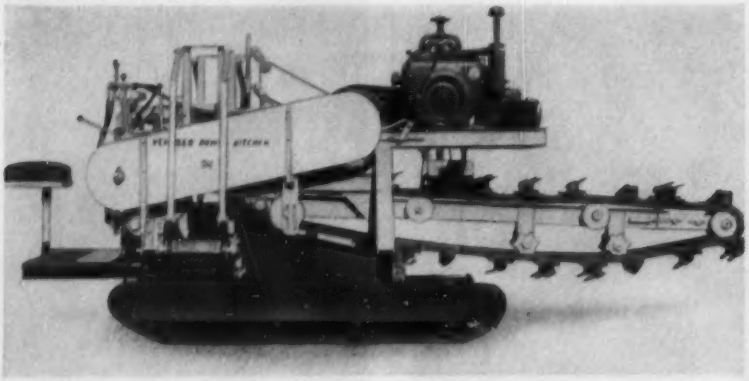
● **REMEMBER W. G. B.** has not--and will not--reduce the size of its S-11C (8 x 15) cartridge. Specify the W. G. B. S-11BC cartridge for *smaller size,* so-called 750 cubic inch oil filters.

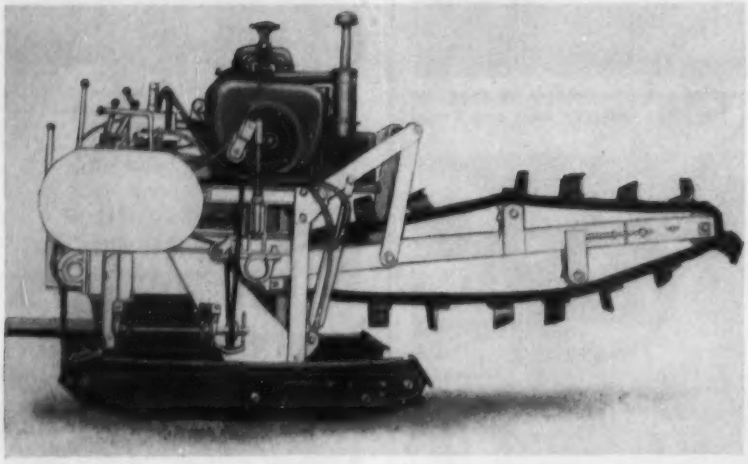
● **W. G. B. MAKES REPLACEMENT CARTRIDGES FOR ALL POPULAR MAKES OF FILTERS.**

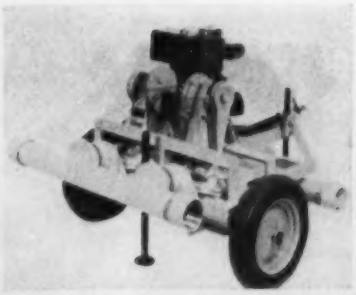
● **SPECIFY W. G. B. AS ORIGINAL EQUIPMENT — OR ORDER FOR REPLACEMENT.**

WRITE FOR COMPLETE DETAILS AND NAME OF NEAREST DISTRIBUTOR

W.G.B. OIL CLARIFIER INC. KINGSTON, NEW YORK





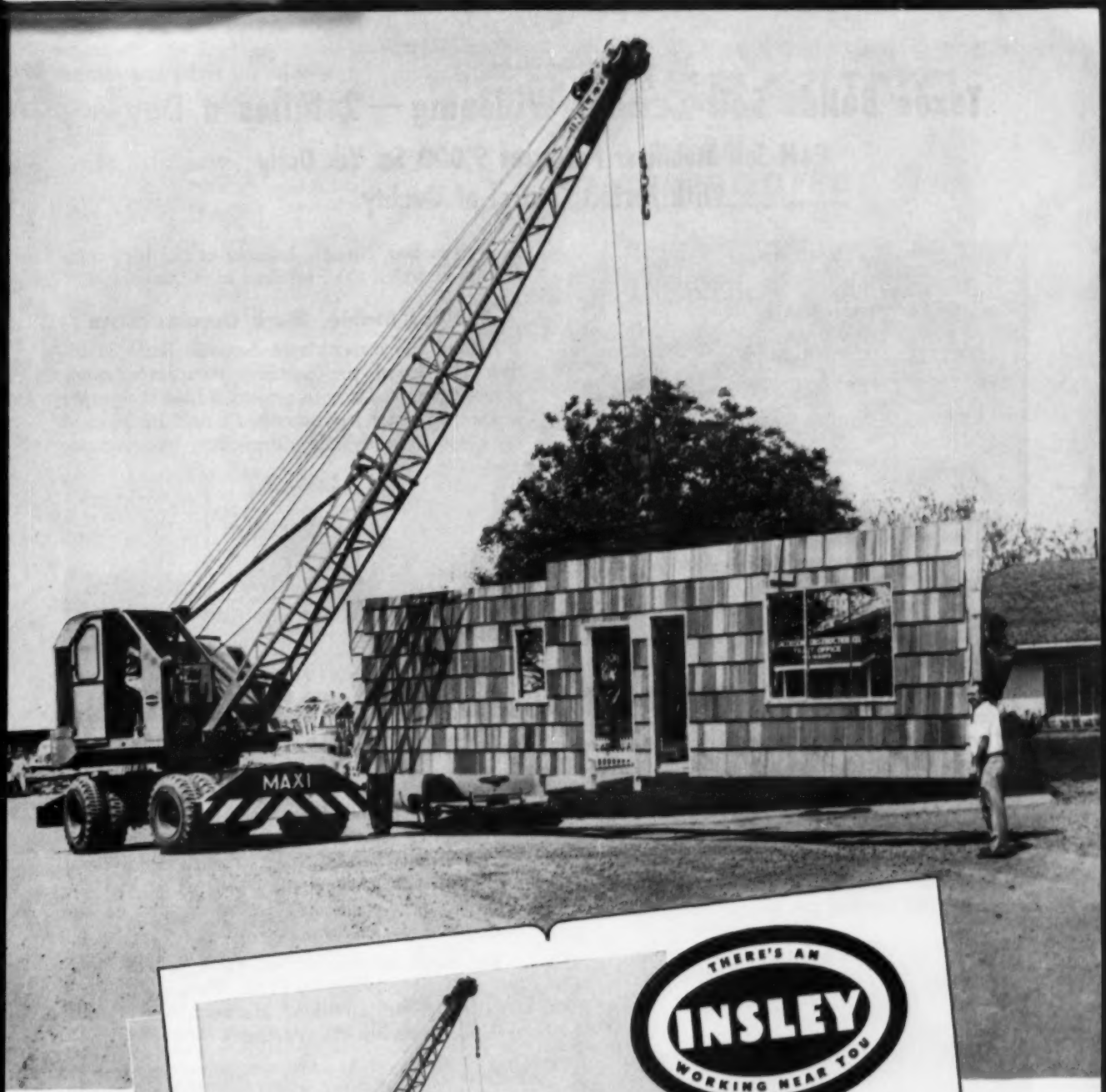


TWIN DIAPHRAGM PUMP—A new 4-in. diaphragm pump combines two single units to double the conventional, pumping capacity. The same ratings applied to the single valve types carry over to the new line of double pumps which now deliver up to 12,000 gph at 10-ft suction lift. The pump has fully enclosed, helical cut gearing which operates in an oil bath on ground shafting and needle bearings. Air-cooled engines transmit their power through a fully enclosed, double-row roller chain which serves to synchronize the two strokes at 90-deg. intervals. Also available are gear-head electric motors. The 12,000 gph unit is mounted on a truck for towing. Two 20x3-in. or 28x6-in. pneumatic-tired wheels, having 43½-in. tread width, provide dependable roadability. When in operation on the job, towing tongue slides back out of the way.—**Rice Pump & Machine Co., Belgium, Wis.**

DITCHERS—The big new Model 524T POW-R-DITCHER will dig 8, 10, 14, 18 and 24 in. wide and down to 6 ft deep, and is equipped with a heavy-duty, 5-speed International truck transmission. A stationary-mounted 25-hp heavy-duty Wisconsin all-cooled or Continental water-cooled engine powers the unit. The entire framework of the 524T has been strengthened to handle the most rugged ditching assignments. It weighs approximately 5,400 lb. Other dimensions include a 90 in. over-all width; 74-in. track width; 80-in. height; 15½-ft. length. The midget of the POW-R-DITCHER line is now the new model 4T. Weighing only 2,500 lb., this small ditcher will dig 6 to 12 in. wide and 4 ft deep. As in the larger models, the 4T features a two-way dirt conveyor, and is powered by a 15- or 25-hp. Wisconsin engine. It is only 42 in. wide, 6 ft high and 13 ft long, and is especially designed for digging gas pipe lines, cable lines and for home construction. The digging boom is raised and lowered hydraulically, and the entire ditcher can be transported in a pick-up truck.—**Vermeer Mfg. Co., Pella, Iowa.**

RIPPER—A special ripping attachment designed to fit a motor-grader mold board is especially useful for backsloping, ditching, working on shoulders and banks, and other areas not easily accessible to the standard scarifier block. With this patented ripper, it is possible to rip road shoulders with all six wheels on the ground, thereby utilizing the full motor power of the grader. Fits all motor graders and most small dozers with mold boards 18 to 24 in. in height. Ripping depths, 7, 13, and 17 in.—**The Hensley Equipment Co., Inc., San Leandro, Calif.**

UNIQUE TRAILER DESIGN—Standard removable gooseneck and axle units permit quick interchange of decks of various lengths and designs for a variety of load-types. The Talbert line offers the advantages of custom-ized design at production prices, safe over-the-front-end loading, equalized load distribution and maximum usefulness.—**Talbert Construction Equipment Co., 7950 W. 47th St., Lyons, Ill.**



THERE'S AN INSLEY WORKING NEAR YOU

RUBBER-MOUNTED FOR MOBILITY

Insley Type K with Crane attachment mounted on a Maxi self-propelled, rubber-tired carrier . . . handling pre-fabricated house sections, concrete bucket and other materials on a housing project.

The Insley Manufacturing Corporation of Indianapolis has been manufacturing construction equipment since 1907. The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted. Let your Insley distributor show you "an Insley at work."

(Advertisement)

Texas Builds Soil-Cement Widening—2 Miles a Day*

P&H Soil Stabilizer Processes 9,000 Sq. Yd. Daily With Perfect Control of Quality

Close-up of P&H Model LA-88 Single Pass Stabilizer processing soil-cement.

Texas State Highway 79, originally built in 1928-29, was recently modernized in record time for today's traffic needs.

State Highway Officials decided the old 18-ft. pavement should be widened to 24 ft., for a total of 17 miles. Low-cost and maximum use of local materials were musts. Low bidder among nine contractors was Austin Asphalt Company, Dallas.

P&H Stabilizer Key to High Production

With the old shoulder soil removed to a 14-in. depth and an 8-ft. width on one side, 30 cu. yd. per station of crushed sandstone were dumped on

Behind the Stabilizer, two sheep's-foot rollers compacted the mixture.

the concrete pavement at regular intervals. This was bladed into the trench, watered and rolled for an 8-in. sub-base. Over this, 20 cu. yd. per station of crushed sandstone were placed to a 7-ft. width. Cement, for an 8% cement factor, was then spread, working no more than 1,000 ft. ahead of the P&H Soil Stabilizer as a guard against cement loss. Actually, this distance ahead was rarely reached, though, because of the high mixing speed which the Stabilizer maintained.

A More Stable, More Durable Base

Behind the cement spreader, the P&H Stabilizer pulverized the partially compacted sandstone, dry mixed it with cement, added the proper amount of water and deposited a uniform layer of soil-cement ready for immediate compaction.

Here curing seal is applied at the rate of 0.2 gallon per sq. yd.

Then, after curing, a 250 lb. hot-mix bituminous surface was placed over the old pavement and widening in two courses to complete modernization of this veteran road. The road was kept open to traffic throughout construction and the widening was opened to traffic as soon as the curing seal was blotted.

For more information on P&H "Single-Pass" Soil Stabilizers, write to C. R. Morgan Jr., P&H Soil Stabilizer Division, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

Side view of P&H Model LA-88 Stabilizer. Only 1 man required to operate.

*The following data is based on a January, 1955 presentation to the American Road Builders' Association Committee on Soil-Cement stabilization by Mr. A. D. January, Wichita Falls, Texas, Senior Resident Engineer of the Texas State Highway Dept.

HARNISCHFEGER

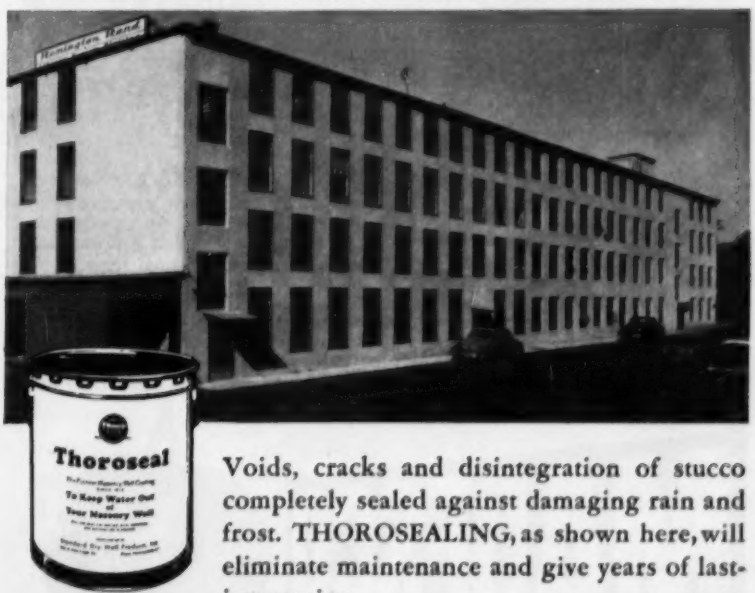
ROCK DRILL—The Pionjar rock driller, a new Swedish built, gasoline - driven tool which is easily convertible to a breaker, weighs only 86 lb fully equipped. A built-in air-cooled, single-cylinder, two-stroke engine is used. It has a floatless carburetor which makes it possible to drill at an angle, horizontally, or even at 45 deg above the horizontal. Drilling speed is about 16 in. per min with a 1.06-in. dia bit in medium hard granite. Drilling depth is 13 ft, and a continuous blower cleans the hole as it blows. Specially designed drill steels for the Pionjar drill are available with plain or collared shanks and in all bit diameters and lengths. **—Stanco Mfg. and Sales Co., 1931 Pontius St., Los Angeles 25, Calif.**

ELECTRIC SANDER—This "Dualine" tool offers a choice of two sanding motions, has a 3/16-in. orbital motion being recommended for fast cutting and for smooth, finished work, a back-and-forth "reciprocal" motion reproducing hand-sanding technique. Change of motion is effected by instantaneous - change platens. Platens measure 3 2/3x7 in. and take one-third of a standard 9x11-in. sheet of sandpaper. Paper is changed by using two convenient external pushbuttons. Said to be ideal for use on walls, ceilings, etc., as well as ordinary uses, the sander weighs only 5 lb. Thumb-controlled slide switch is mounted in a streamlined flatiron-type handle. Operations at a rate of 5,500 per min. are obtained from the ⅛-hp Universal ball-bearing motor. A polyvinyl bumper encircling the sander protects finished surfaces near which it may be used.**—Fairchild Industries, Burlington, Vt.**

THOROSEALING
MEANS
WATERPROOFED

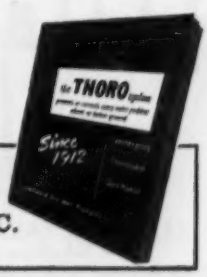
Stucco-surfaced factory building gets protective coat of Buff THOROSEAL for longer life.

During renovation. Far right of Remington Rand factory building showing application of THOROSEAL, in contrast.



Voids, cracks and disintegration of stucco completely sealed against damaging rain and frost. THOROSEALING, as shown here, will eliminate maintenance and give years of lasting service.

Materials applied by Remington Rand Inc. Maintenance Department. Herkimer, N. Y.

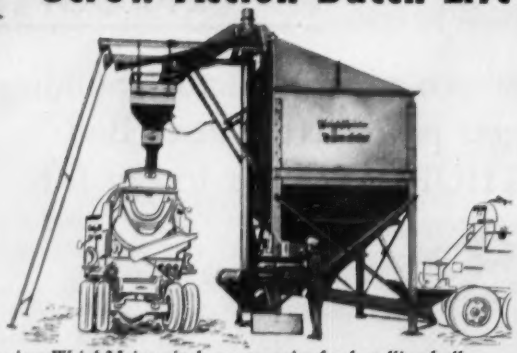


Get our pictorially described literature
"HOW TO DO IT"
STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA

NEW

WEIGHMEISTER
Screw-Action Batch Lift

Self-Contained
Portable
Accurate
Automatic Operation
Fast



Fast-working screw lift gives WeighMeister its large capacity for handling bulk cement. The precision-fed batcher and automatic electro-pneumatic controls provide dependable, accurate, constantly uniform mixes. One man can operate the WeighMeister with three push buttons . . . and it's *completely self-contained!* It's equipped with compressor, automatic controls and electric motor or gas engine. All air and electric lines are permanent; no connections to waste time in moving. Can be moved on a single truck. Needs no footings or ramps. Just set WeighMeister on a firm level spot . . . and have it running in a short time. See your distributor or write for details. L. Burmeister Co., 4535 W. Mitchell St., Milwaukee 14, Wis.

COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4535 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

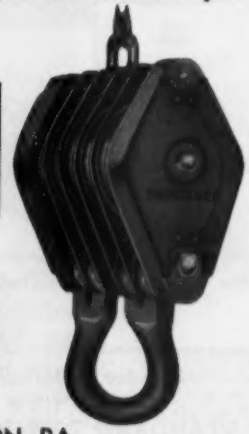
All Madesco Blocks Are Engineered to Serve Your Special Service Needs

FOR SAFE AND SPEEDY HOISTING

Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service.

Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.

MADESCO BLOCKS



MADESCO TACKLE BLOCK CO., EASTON, PA.
A Subsidiary of Nazareth Cement Company

HAE-MB-104,55

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

WELLPOINT LITERATURE—Three pieces of literature covering Wellpoint Dewatering System, Pumping, Wellpoint System and Pumps for Jetting may be obtained by contractors and engineers who send their request on their company letterhead.—**Griffin Wellpoint Corp., 881 E. 141st St., New York 54, N.Y.**

CONCRETE SURFACER—A self-powered machine designed to broom, belt or burlap-drag concrete slabs, adjustable to any width is described in Bulletin P-117 from the **Flexible Road Joint Machine Co., Warren, Ohio.**

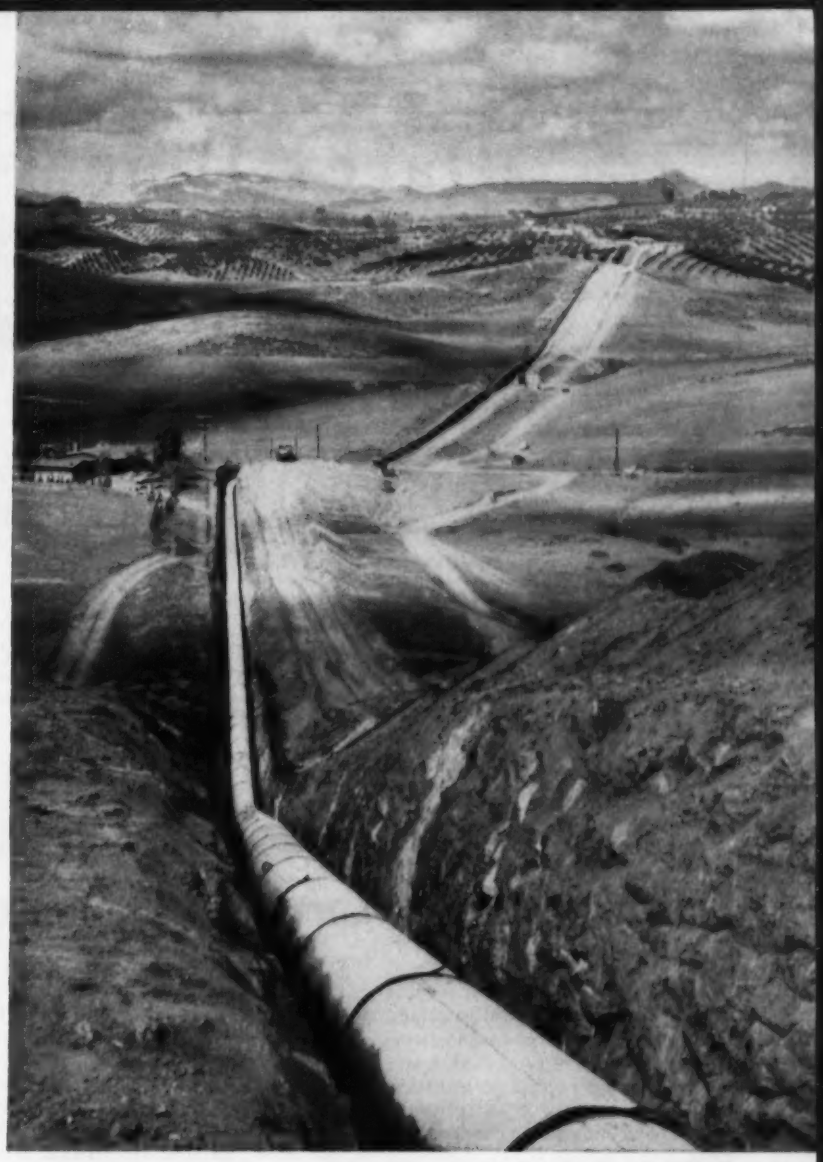
GE CONTROL DEVICES—A new 68-p catalog of general purpose control devices designated GEC-1260-A, includes a special section correlating by horsepower components, for each type of motor control. The two-color publication contains photos, book prices, wiring diagrams and dimensions on motor starters, contractors, relays, solenoids, switches, push buttons and pilot devices. Also included is information comparing applications and merits of manual and magnetic control, and across-the-line and reduced-voltage control. Other data covers starter modifications, auxiliary interlocks and renewal parts.—**General Purpose Control Dept., General Electric Co., Schenectady 5, N.Y.**

POWERDIGGER — A new booklet describing the Sherman Power Digger contains illustrations and explanations of the wide ranges of uses for the unit. Accessories, work range and specifications for the machine also are covered.—**Sherman Products, Inc,. 3200 W. 14 Mile Road, Royal Oak, Mich., Dept 000.**

MANLIFT—A new two-color folder has been released describing the Humphrey Manlift Elevators. These units are power-driven, continuous-belt type with hand-holds and steps at proper intervals to provide simultaneous up and down employee transportation. They can be installed to service any number of floor levels and require only a fraction of the floor space required for conventional elevators. The folder also contains data on safety features required to comply with the varying state codes and laws. Specify HF-55, when writing the **Humphreys Elevator Co., Faribault, Minn.**

ACROSS HILLS AND VALLEYS

Explosives Research Pays Off



Blasting trenches in hard granite formations to install a pipeline in Southern California called for engineering skill, operating know-how, and a knowledge of explosives.

Over hills and valleys and across rivers and gorges, pipelines provide safe, sure, economical means of transportation for petroleum, natural gas, water, and other mineral resources. When rock is encountered, blasting crews with specialized explosives take over. Here is where explosives research pays off.

Continuous research and extensive knowledge of field conditions have been Hercules' business for more than forty years. Hercules technical representatives welcome opportunities to discuss problems and help in the selection of the right explosives and the most efficient methods for use in mining, quarrying, construction, and exploration projects.

HERCULES

HERCULES POWDER COMPANY

INCORPORATED

Explosives Department, 974 Market St., Wilmington 99, Delaware

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazelton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

(Advertisement)

Darex Diary

by Henry L. Kennedy

Member, American Concrete Institute
Manager, Construction Products
Dewey & Almy Chemical Company

*Factors which affect control of air entrainment in concrete

*Specifications for making above-grade masonry water-repellent

REQUIRED AIR CONTENTS can vary 100% in mixes containing different-sized aggregates. Therefore, we've got to be realistic about adding air entraining agents to concrete. Adequate measuring equipment — and trained personnel to operate it — is a must. It's not as simple as knocking a hole in the drum of AEA and adding a "slug" when it's needed.

Let's look at the average range of air contents:

Max. Size Agg. (In.)	Ave.% Air Recommended	Range Air Percentages
6	3	2–4
2	4	3–5
1½	4½	3½–5½
1	5	4–6
¾	6	5–7
⅜*	8	7–9*

*This is really a modified mortar, not concrete as we think of it.

At a rate of ½ to ¾ oz. per sack of cement, DAREX AEA will generally satisfy the above recommendations. But, like the rules of English grammar there are always exceptions and these will either increase or decrease the amount of air entraining agent required.

These conditions, for example, will *decrease* the amount of air to be added:

1. *where abnormally high percentages of sand or of the 30-100 mesh sand fraction have of themselves increased the air content.*
2. *when cold weather has caused more air to be entrained.*
3. *a higher slump (up to 6 inches maximum) gives more air in concrete.*
4. *cement already containing some inter-ground air entraining agent, such as "transition" cement.*

On the other hand, the amount of air may have to be *increased* because of inhibitors such as these:

1. *deficiency of the 30-100 mesh sizes in the sand, or more important, an excess of the 200 mesh size.*
2. *switching from soft to hard water.*
3. *excessive over-loading of the mixer — mixing blades in poor condition.*
4. *switching from a structural mix (max. size ¾" and 5" slump) to a paving mix of low slump (2").*
5. *mixing time too short.*

But here is the real zany situation we encounter at times. In certain geographical locations the fine aggregate may contain a conglomeration of organisms which can actually be saponified by the alkali in the cement to an extent that 4 to 5% air will be entrained. Tests show that this "accidental" air is of little value in increasing the durability of the concrete. Hence, it is necessary to put in a de-airer to eliminate this air, and then add the proper amount of air entraining agent to put back the proper type and amount of air. This situation exists in at least two locations of which I have heard, one in the State of Washington and the other in Canada.

* * *

I MENTIONED in a recent Diary the wonderful job which can be done with DARAWELD cement combinations as a water repellent for the interior of below-grade surfaces.

This should not be confused with the excellent protection of exterior above-grade masonry against efflorescence, weathering and staining effected by our water repellent called DARACONE. DARACONE is a balanced formula of a special silicone resin and solvent. Maybe you would like to have a copy of our prepared specifications which have led to excellent results on applications where other water repellents have failed.

Drop us a line and ask for Bulletin H-S, which contains these specifications and other pertinent information about tests you can make to insure the lasting protection of masonry walls.

DEWEY and ALMY CHEMICAL COMPANY
DIVISION OF W. R. GRACE & CO., **Cambridge 40, Mass.**

Offices or Subsidiaries in principal U. S. cities
and in Buenos Aires, Copenhagen, London, Melbourne, Milan, Montevideo, Montreal, Naples, Paris, São Paulo, Tokyo.

EQUIPMENT DEPRECIATION—A new booklet, "New Methods of Depreciation for Contractors," shows the various methods of computing depreciation, their relative advantages and limitations, as well as typical examples and comparisons. It shows how early depreciation of equipment costs enables a contractor to reinvest his money at the most appropriate time. — **The Jaeger Equipment Co., Columbus 16, Ohio.**

MONOLITHIC SLABS—The 1955 Flexicore floor and roof slab system catalog, an 8-p booklet, outlines properties and uses of monolithically cast slabs, diagrams basic structural and mechanical details, and describes erection procedure. Included for the first time is a new, three-core 6x16-in. slab, along with the two-core 6x12-in., 6 5/16x12-in. and 8x16-in. sizes. Flexicore slabs are prefabricated to inch lengths up to 26 ft 8 in. —**Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio.**

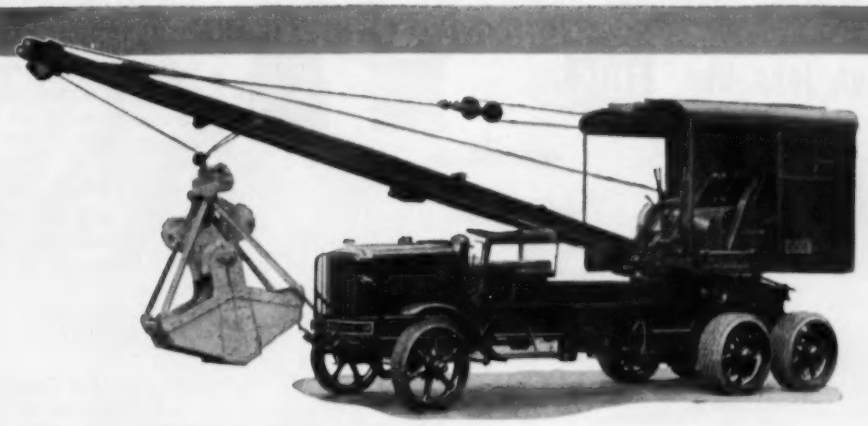
HAND PUMPS—A new 4-p general bulletin gives a detailed description of the full line of Blackmer Rotary Hand Pumps, including outstanding performance features, application information and other pertinent data. This provides a valuable source of information for all interested in liquid materials-handling problems. Ask for Bulletin 320.—**Blackmer Pump Co., 1809 Century S.W., Grand Rapids, Mich.**

CENTRIFUGAL PUMPS—A new bulletin on contractor's portable self-priming centrifugal pumps, offers information on details of construction, specifications and component parts. Rating charts are included, showing performance requirements under average job conditions for each size pump in the Worthington Blue Brute line. Two tables list pumping unit and engine data for various models rated from 4,000 to 40,000 gpm. For further information address requests to **The Worthington Corp., Advertising and Sales Promotion Dept., Harrison, N. J.** Specify Bulletin 1230-B1.

WHERE TO BUY

SIGHT LEVELS INSTANTLY!
STRATEX SURVEYING
Hand Level
$12
IN U.S.A.
STRATEX INSTRUMENT CO., INC.

do you remember . . .



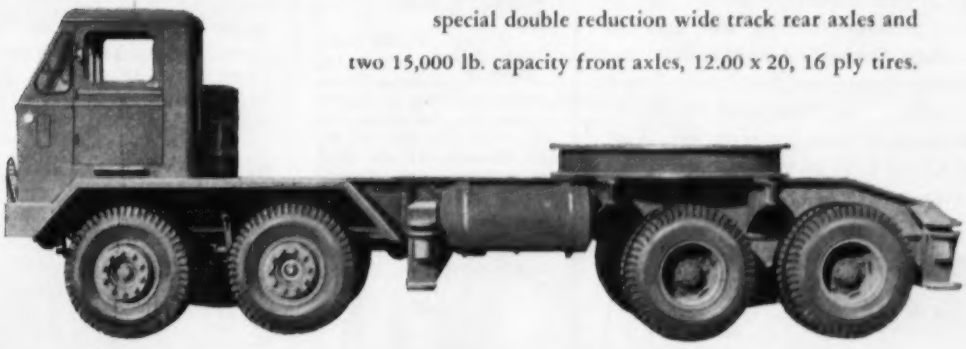
this 1927 crane carrier . . .

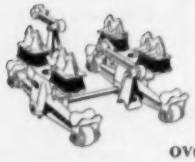
Hendrickson designed and built this special crane carrier, double-drive with extra wide solid tires (one of the first factory produced jobs in the country), which carried a 7½ ton Universal Crane . . . delivered April 1927.

today HENDRICKSON builds . . .

a complete line of crane carriers, 10 to 50 tons capacity.

This Hendrickson Model 535 (8 wheeler), 35 ton 8 x 4 has Hendrickson's special double reduction wide track rear axles and two 15,000 lb. capacity front axles, 12.00 x 20, 16 ply tires.





Featuring the Hendrickson Tandem which permits the load to be evenly distributed over the 4 wheels—*steadiest thru the swing.*

FOR ADDITIONAL INFORMATION WRITE DEPARTMENT B

HENDRICKSON Mfg. Co.

8001 WEST FORTY-SEVENTH STREET
LYONS (CHICAGO SUBURB) ILLINOIS

Moments like THIS can help reduce insurance costs on jobs like THIS

View of construction of eight of the piers that will support the New York Thruway Bridge nearing completion across the Hudson River between South Nyack, New York and Tarrytown. Merritt-Chapman & Scott Corporation, Contractor, use AJAX Cups and drinking water equipment on this job.

Several times a day — at moments when he is relaxed, receptive, ready to read—crisp, clean AJAX Cups put their imprinted safety messages right in this worker's hands.

And safety messages *that get read*, says the National Safety Council, definitely help reduce accidents. Fewer accidents mean lower insurance costs . . . can even spell the difference between profit and loss on a job. Why not put AJAX to work in *your* accident prevention program?

A TYPICAL EXAMPLE

(Actual case history from insurance company files)

One year Contractor B paid insurance premiums of $16,165. The next year his payments totalled only $14,286. Yet his base manual rate for the second year actually was nearly $2000 *higher* than the first. He saved that, and $1869 more, because an active accident prevention program earned him a substantial credit on his second year premium.

AJAX® CUPS and Drinking Water Tanks deliver fresh water to workers — mean less time lost on the job. AJAX Cups and new all-size Dispenser are also ideal for stationary tanks, barrels, pipeline faucets. 4 oz., 6 oz., and 7 oz. sizes packed imprinted with assorted stock safety messages — or your own message to order.

GET THE FULL STORY—Write us today for this new folder which gives full details on imprinted AJAX Cups and equipment.

United States Envelope Company

General Offices: • Springfield 2, Mass.

15 DIVISIONS FROM COAST TO COAST

C-9C

BIG JOBS OF THE MONTH . . .

Continued from page 30

Virginia Engineering Co. Inc., 29th St. and James River, Newport News, Va. 15-story basement, subbasement, concrete State office building Richmond, Va. for the Commonwealth of Virginia, State Finance Bldg., Richmond. $2,641,000.

George A. Fuller Co., 3100 W. 8th St., Los Angeles, Calif. Test facility, Edwards Air Force Base, Muroc, Calif. for U. S. Engineers, 751 S. Figueroa St., Los Angeles, Calif. $4,990,584.

Consolidated Engineering Co., Inc., 20 E. Franklin St., Baltimore, Md. Petroleum crackling catalyst plant, Curtis Bay, Baltimore, Md. for Davison Chemical Co., Davison Chemical Bldg., Baltimore. $4,000,000.

W. E. O'Neil Construction Co., 2751 Clybourn St., Chicago. Grading, drainage, structures, reinforced-concrete paving 1 mi of the Indiana East-West Toll Road in the city of Hammond, Lake Co., for Indiana Toll Road Comm., 39 W. Washington St., Indianapolis, Ind. $5,486,858.

Worth Construction Co., 300 Greenleaf St., Fort Worth, Tex. Concrete apron runway and taxiway strengthening at Connally Air Force Base, Waco, Tex. for U. S. Engineers, Box 1600, Fort Worth, Tex. $3,611,658.

Darin & Armstrong, Inc., 2041 Fenkell St., Detroit, Mich. Engineering building at Detroit for the Chrysler Corp., J. C. Zeder, vice-president, 12800 Oakland St., Detroit 3, Mich. $10,000,000.

Morrison-Knudsen Co. Inc., 319 Broadway, Boise, Idaho. Grading, installing 16-mi railroad track on Washington shore of Columbia River near the Dalles Dam, Wash. for the Spokane, Portland and Seattle Ry Co., C. F. Thomas, chief engineer, 1101 N.W. Hoyt St., Portland 7, Ore. $2,407,076.

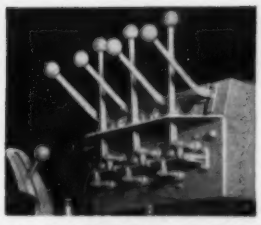
Townsend & Bottum, Inc., 2245 S. State St., Ann Arbor, Mich. Unit No. 5 Picway generating plant, Circleville, Ohio, for Columbus & Southern Ohio Electric Co. 215 N. Front St., Columbus, Ohio. $9,000,000.

More "Big Machine" Features on the MICHIGAN C-16 than on any other ½-yard crawler!

This is a fact: more "big machine" features are *standard equipment* on the MICHIGAN C-16 than on any other ½-yard crawler. It will pay you to look underneath — look inside to see how much more you get for your money.

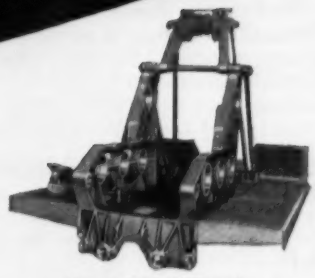
This machine is built for quality-conscious users—for bigger yardage, bigger tonnage, and substantially lower maintenance. The C-16 invites a feature-by-feature comparison with other same-capacity machines.

Write for detailed literature on this ½-yard crawler with big machine features and durability. Or contact your local MICHIGAN distributor. Like all MICHIGAN machines, the C-16 is available on a low-cost Lease Plan—details available.



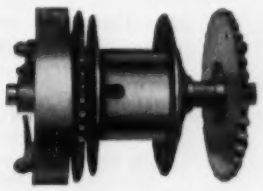
Power Control Independent Travel

Air Controls are standard on all MICHIGANs . . . fast, smooth, precise, with low operator fatigue. Independent Travel is also standard . . . move up while hoisting, swinging, or dumping.



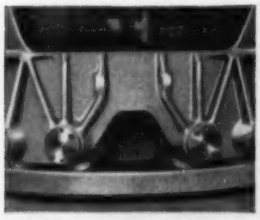
Cast Steel Deck

This feature is usually found only on 1-yd or larger machines. C-16 deck is one-piece, alloy steel casting . . . side frames, boom foot lugs and roller brackets are cast integral. No misalignment!



Power Load-Lowering

Four shafts on the C-16: Swing, Hoist, Travel and Crowd . . . each with its independent clutches. For precision crane work, the hoist line can be reeved on the front drum to provide Power-Up and Power-Down.



Six Hook Rollers

You can swing the boom just by leaning against it. There are 6 ball bearing-mounted adjustable hook rollers on the C-16 . . . grease twice a year. Most other ½-yd machines have only 3 or 4 rollers, bushing-mounted.

Smooth Clutches

There's nothing smoother than MICHIGAN air-operated segmented disc clutches . . . and they are self-compensating for heat, self-ventilating and self-cleaning. All segments are interchangeable.

Cast Steel Car-Body

Circle gear, with hook roller paths, internal gear teeth, center post, and crawler drive gear case is cast integral. Standard alloy steel tracks are 20" wide, 9'10" long. Swamp pads are optional: 30" wide, 11'10" long.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY, 380 Second Street, Benton Harbor, Michigan. (29A)

Construction Machinery Division
Phone: WA 6-6184

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Specified density of base courses of rock, slag, soil-bound macadam, gravel and sand up to 12" thick is achieved in jig-time with the JACKSON MULTIPLE VIBRATORY COMPACTOR. Frequently no more than one pass is required. Likewise, one pass suffices to solidly fill all voids from top to bottom when sufficient dry fines have been spread. With a standard width of 13', 3", working speeds up to 60 FPM and reverse travel of 5½ MPH, this machine offers single course compaction at its best — tremendous opportunity for time-and-money savings.

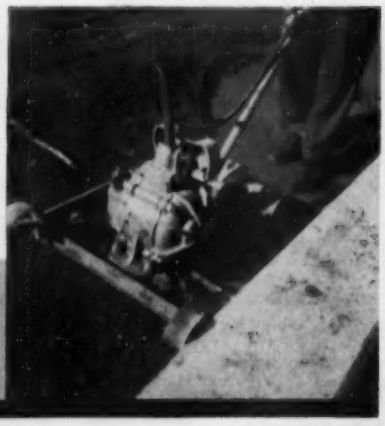
GRANULAR SOIL SUB-BASES — PAVEMENT WIDENING

It is equally advantageous in compacting granular soil sub-bases. And by towing the compacting units in tandem at the side of the tractor, any granular material used in flexible base course widening can be compacted to specified density in one pass.

LARGE AREA FILLS: Nothing approaches the efficiency and convenience of this machine in compacting granular soil fills such as bridge approaches, sub-bases for large concrete floors, parking lots, etc. It quickly achieves desired density and individual units may be sub-contracted and even fitted with operating handles to suit every condition and to get into the really tight places. Interchangeable bases 12" to 26" in width, are available.

IN TRENCHES — CLOSE TO FOOTINGS, ETC.

The manually-guided, self-propelling JACKSON COMPACTOR (similar to one of the compacting units used in the MULTIPLE, fitted with operating handle) has proved exceedingly successful on thousands of granular soil compaction jobs and is widely used for bituminous pavement patching. Operated from a Jackson Power Plant on auto trailer having quick pick-up device for loading and carrying Compactor.



See your **JACKSON DISTRIBUTORS** or write us for complete information.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

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Wolverine Contractors know how to get more work out of equipment—use STANOLUBE HD-M Motor Oil

Norris Host (right), President of Wolverine Contractors, Inc., and Robert Larsen, Standard Oil automotive lubrication specialist, talk lubrication on job site. Customers of Bob's like to talk lubrication with him. They know it can pay off for them in better, lower cost operation of equipment. Bob's seven years' service with Standard Oil gives him a solid background of experience for this sort of work.

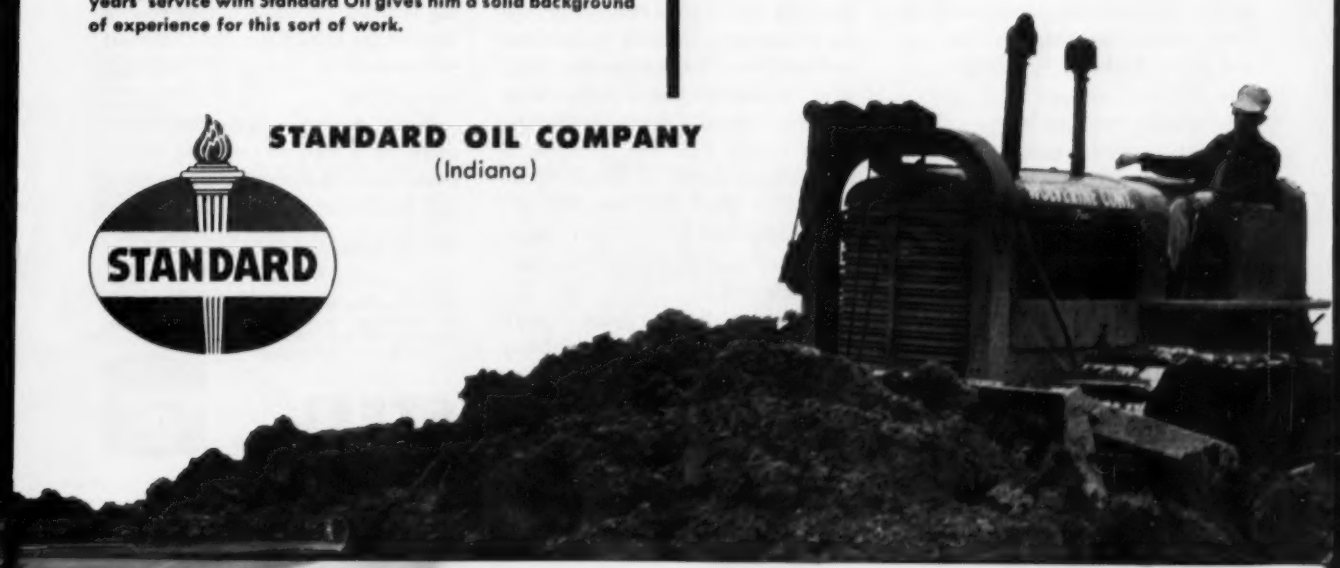
Wolverine Contractors, Inc., Detroit, know that good maintenance begins with good motor oil. They have used STANOLUBE HD-M Motor Oil for many years in both gasoline and diesel equipment. On overhauls, engines come down clean and free of sludge. These are the reasons STANOLUBE HD-M delivers this clean, sludge-free performance:

1	STANOLUBE HD-M Motor Oil is refined from high quality base stock.
2	Additives exclusive with STANOLUBE HD-M retard oxidation of the oil, reduce formation of piston and ring belt deposits.
3	These additives in STANOLUBE HD-M prevent fuel from forming varnish and sludge.

STANOLUBE HD-M makes the maintenance job easier for maintenance men by: extending periods between overhaul; making the overhaul job easier when it is done; reducing wear and eliminating corrosion of bearing metals. STANOLUBE HD-M Motor Oil makes the construction job more profitable for the contractor by helping him get more operating hours out of equipment.

Get the facts about STANOLUBE HD-M Motor Oil. Get in touch with your Standard Oil automotive engineer. In the Midwest call your nearby Standard Oil office. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Dozer helps with grading on Wolverine Contractor project. As with all equipment Wolverine operates, this dozer gets Standard Oil lubrication exclusively.



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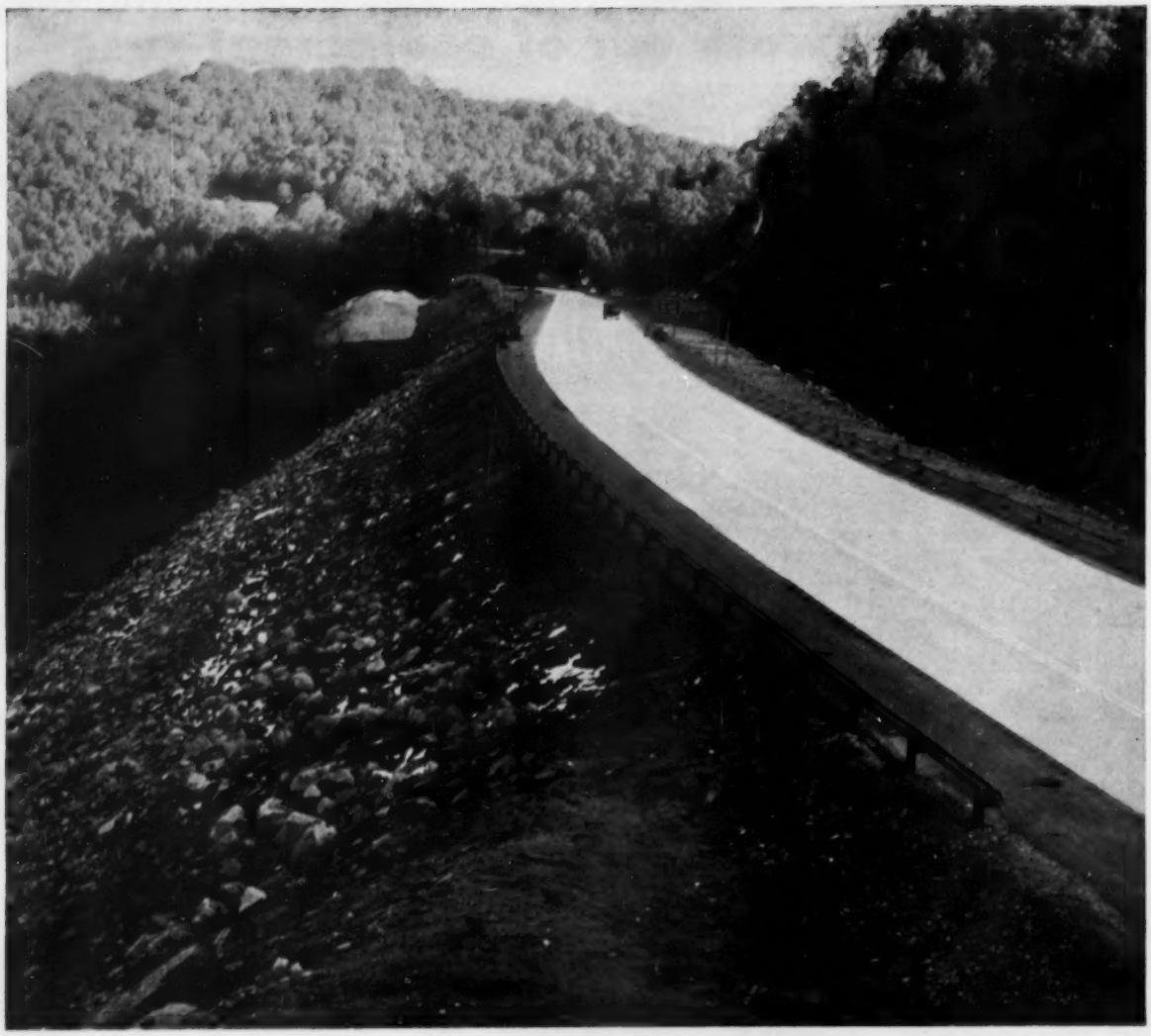
(Indiana)

STANDARD



Safety-Beam Protection at "Million Yard Fill"

Pushing the recently completed West Virginia Turnpike through the rugged foothills of the Alleghenies has been called "the toughest road job east of the Rockies." Winding mountain streams, canyons and sharply pitched hills were hardly an ideal terrain for roadbuilding.

To build the new highway with grades generally less than 3 pct and with curves limited to a minimum radius of 1000 ft required tremendous excavating, grading and filling operations. More than 70 bridges were built to carry the 88-mile-long turnpike over the mountainous terrain.

Near Beckley, W. Va., is the "million yard fill," a good example of how the terrain was "rebuilt" to conform to the highway's specifications. Here, as at many other points on the West Virginia Turnpike, Bethlehem Safety-Beam Guard Rail was installed to help protect motorists. These sturdy sections of steel plate were bolted flush end-to-end to steel posts, making a continuous beam of impact-absorbing rail.

Bethlehem Safety-Beam Guard Rail is a strong and effective highway guard, with sufficient strength to withstand severe shocks from colliding vehicles, yet enough flexibility to redirect the vehicle parallel to the rail with minimum damage to both rail and vehicle.

Write to the nearest Bethlehem office for a copy of our new Safety-Beam Guard Rail catalog which gives full details and specifications.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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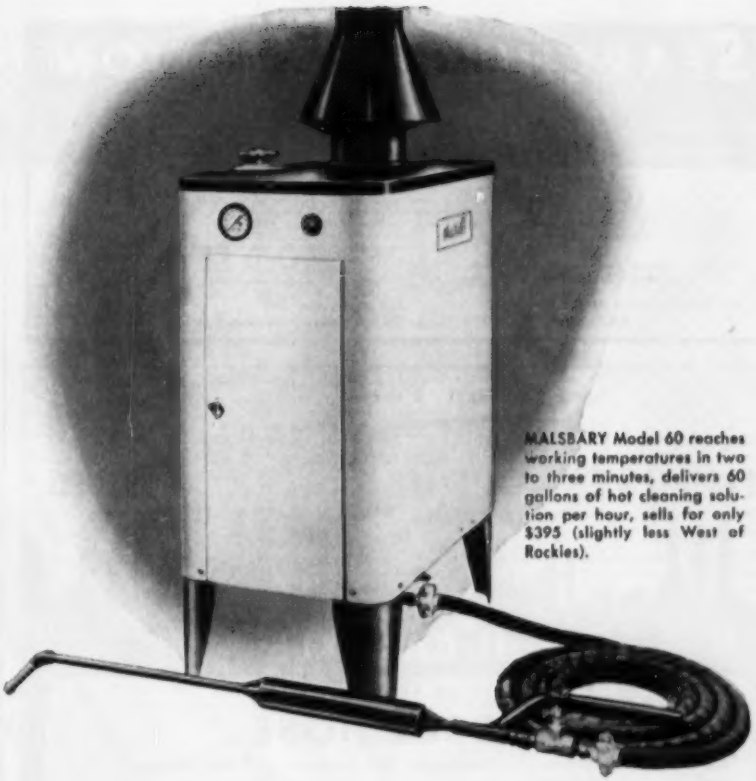

MALSBARY Model 60 reaches working temperatures in two to three minutes, delivers 60 gallons of hot cleaning solution per hour, sells for only $395 (slightly less West of Rockies).

NOW FOR HANDY, IN-SHOP STEAM CLEANING,

Malsbary 60—Only $395

New Malsbary 60 steam cleaner, built specifically for parts cleaning and other light work, is so small you can install it right in the shop for use on individual repair jobs.

Job studies show mechanics spend 30-40% of their working time wiping grease and muck off parts before they can get down to repair work. With the MALSBARY 60 you can eliminate this hand wiping. Mechanics can use it right at their jobs to quickly steam clean away grease, oil and dirt as they go about their regular repair work.

Malsbary 60 is nozzle controlled, simple as a wrench to use. Mechanics can pick up cleaning gun, have hot solution instantly, because burner goes on instant cleaning nozzle valve is opened; shuts off automatically when valve is closed. There's no running back and forth to start and stop flow of cleaning solution; no carrying of parts to special cleaning area. You quickly save the $395 cost in mechanics' time alone.

Malsbary 60 works directly off any water main where water pressure is 60 pounds or more...without using a pump. For those few areas where water main pressure is below 60 pounds, MALSBARY makes available a pump and motor assembly which adds 50 p.s.i. to water main pressure. Thus, if pressure from main is 40 p.s.i., you get a 90-pound cleaning stream by using this pump. Pump and motor assembly, ready to bolt to cleaner, $90 delivered.

Burner uses low pressure natural gas, butane, propane or manufactured gas. Special safety control automatically shuts off burner if water flow is interrupted.

Ask your jobber to install at least one Malsbary 60 in your shop NOW... prove to yourself how it saves mechanics' time.

67

MALSBARY SINCE 1921 MANUFACTURING CO.

Room C5, 845-92nd Ave., Oakland 3, Calif.

SEARCHLIGHT SECTION

Classified Advertising

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** EQUIPMENT USED OR RESALE

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Positions Wanted undisplayed advertising rate is one-half of above rate payable in advance.

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Individual Spaces with border rules for prominent display of advertisement.

The advertising rate is $15.75 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

An advertising inch is measured ⅞" vertically on one column, 3 columns—60 inches—to a page.

Send New Advertisements to New York office, 330 W. 42nd St., N. Y. 36, N.Y. for June issue closing May 6th.

EMPLOYMENT ADVERTISING: See new section announcement below.

When You Need
LOW COST—DEPENDABLE
INDUSTRIAL RUBBER PRODUCTS

call CARLYLE

FOR ALL YOUR REQUIREMENTS OF

RUBBER HOSE

Air, Acid, Paint Spray; Solvent Welding, Pile Driver; Discharge Fire, Fuel Oil; Oil Suction & Discharge, Gasoline; Suction Water, Steam; Vacuum Pneumatic, Road Builders

BELTING

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PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

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ENGINEERS—FOREMEN—OFFICE MEN
Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 5th Ave., Lake Worth, Florida

RENT STEEL SHEET PILING

Get the exact lengths and sections you need from Foster—all standard makes, delivered *on time*—and at Foster's standard low rental rates. Also Rental Pile Hammers & Extractors.

L.B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5

N O W
Fast, easy way to
CUT WIRE ROPE
Low cost, portable, safe
For details mail ad to
MONTGOMERY MFG. CO.
24Y Austin St., Newark 5, N.J.
Dealers wanted

Attention . . .

EMPLOYMENT ADVERTISERS

Effective with the July issue, a new section will start in Construction Methods & Equipment. We will head this section: EMPLOYMENT OPPORTUNITIES. All Displayed Employment Opportunity advertising will be placed in this new section, with the exception of those advertisers who contract for run-of-book position. New advertisers will be billed at the transient rate of $18.00 unless on contract. Contract rates furnished on request. Advertisements are subject to Agency Commission.

For full information write:

CONSTRUCTION METHODS AND EQUIPMENT
Classified Advertising
330 WEST 42nd ST.
NEW YORK 36, N. Y.

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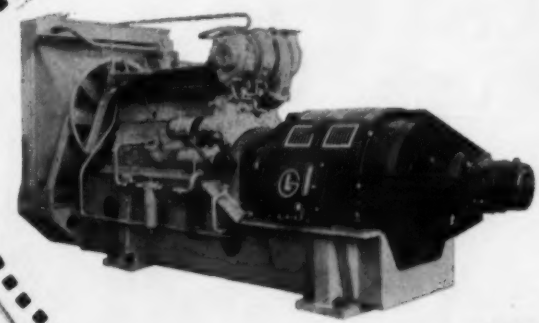


DEMAG A.G., Duisburg, manufacture electro-welded Universal Excavators since 1929 and are known as pacemakers in the welded construction of: truck frames, rotating platforms, winch frames, face shovel booms, dragshovel booms, drums, and sheaves.

Demag Diesel or electric-powered Universal Excavators, with dipper capacities ranging from ½ to 9 cu. yds., are in operation all over the world.

DEMAG-BAGGERFABRIK GMBH

DÜSSELDORF-BENRATH, GERMANY

Postfach 90 · Fernschr. TW 703-0822703 · Telefon 71421

Telegramm-Adresse DEMAGBAGGER DUSSELDORF

DBA 4018

Methods Memo . . .

U. S. GOVERNMENT CONTRACT PROCEDURE can be pretty confusing at times, but if you think you've got troubles, sit in on this actual Japanese bid opening, reported in the U. S. Navy's Civil Engineer Corps Bulletin.

As in the United States, the contract is to be awarded to the low bidder on a lump sum basis. At this point the similarity ends.

The time for opening bids for an underground substation, Yokosuka Naval Station, is 11:00. Nine contractors post their bids (written on a folded piece of paper) in a small wooden box. The box is opened immediately by Ministry of Construction members, and the bids are read.

The chief of the contracts section next opens a sealed envelope containing a detailed estimate made by the Ministry estimating section. He then compares the bids with the government estimate. He announces that the lowest price far exceeds the available funds and that another bid will be taken—at 11:15 the same day.

All contractors leave the room and immediately rewrite their bids, and the opening procedure is repeated. The bids are still too high. The chief announces that bids will be opened again at 11:25!

At 11:26, the chief announces again that all bids are too high. At this point, eight of the contractors drop out. One contractor leaves the room and returns in 5 min with his final bid.

This time the bid is within the limit of available funds, and the contract is awarded.

Could this be an all-time speed record for driving bids down?

PROOF THAT SAFETY does pay off comes to Contractor H. B. Alexander, right, president of H. B. Alexander & Son, Inc., Harrisburg, Pa., as he receives a National Safety Council Award for Meritorious Service to Safety. The award presented by George O'Rourke, Sr., Dallas contractor, reads "in full cognizance of the great contribution of one man to construction safety." Mr. Alexander is past general chairman of the Executive Committee, Construction Section, National Safety Council, and presently is chairman of the accident prevention committee of the Associated General Contractors of America.

GOOD NEWS for highway builders comes from Deputy Commissioner A. C. Clark of the U. S. Bureau of Public Roads. Commenting recently on the need for new and more workable specifications, Clark said: "Contractors may expect to see a trend toward more liberal specifications for future highway construction in some respects. Many of the highway departments have revised and modernized their specifications within the last year or are now in the process of doing so. There is a noticeable move toward the inclusion of alternate methods or materials, or both, in specification requirements. The tendency to spell out methods and specific equipment to be used in accomplishing certain construction items is being changed, where feasible, to more general terms by which contractors are given a greater opportunity to exercise their traditional ingenuity with the types of equipment and methods that can most readily accomplish required results. The Bureau of Public Roads is following this trend in revising its own specifications for highway work. Work on these revisions is now in progress."

FIRST WE HAD a tractor manufacturer launch a selling program called Tractorama and now Worthington Corporation, Harrison, N. J., has announced a concentrated program of selling through on-the-job demonstrations to be called "Mixerama." The idea behind the plan is to show ready-mix operators just how the Worthington Hi-Up Mixers will perform on the job.

WANT TO TEACH someone in your organization how to run earthmoving equipment? The National School of Heavy Equipment Operation, Inc., Charlotte, N. C., is offering three courses guaranteed to do just that. One course trains men in care and operation of three sizes of crawler tractors, self-propelled scraper and tractor drawn scraper. Another is devoted to motor grader operation and course No. 3 to operation of the hoe, dragline and clam shell. Tuition for each course is $200, not including meals. Each course requires 200 hr.

A WORD OF ADVICE to contractors who have dealings with government contract appeals boards (set up in accordance with recent legislation that offsets the effects of the "Wunderlich" case): In addition to filing a written appeal, be sure to send a representative to explain your side of the case in person. So advises Wilbur H. Dexheimer, commissioner of the U.S. Bureau of Reclamation, who states that most board members are lawyers unfamiliar with the intricacies and niceties of construction operations.

"DELAYS-DAMAGE CLAUSES" may soon be included in Navy construction contracts. Designed to protect the contractor from suffering losses from unforeseen government interruption or suspension of work on a project, the clause provides for contract price adjustment to cover the contractor's increased cost of performance. Present contract forms allow only an extension of completion time, without provision for monetary changes, when the government delays a job. Rear Admiral J. R. Perry, chief of the Bureau of Yards and Docks, admits, "This lack of avenue of relief for the contractor in the event of such possible occurrences imposes on him a risk which I believe we in government are obligated to eliminate."

POZZOLITH

in concrete for quality control

Shown here are two of many important structures built since 1932 in which Pozzolith improved engineers' control of concrete quality.

Pozzolith, an admixture for concrete, is the key to lowering unit water content—most important basic factor affecting the quality of concrete, according to leading concrete authorities.*

Pozzolith also permits rigid control of entrained air and rate of hardening of concrete.

Any one of our 70 skilled field technical men will be glad to demonstrate the full advantages of Pozzolith for your work.

* American Concrete Institute, Committee 613, 1944 Report, Page 655
Bureau of Reclamation's current Concrete Manual, Page 130

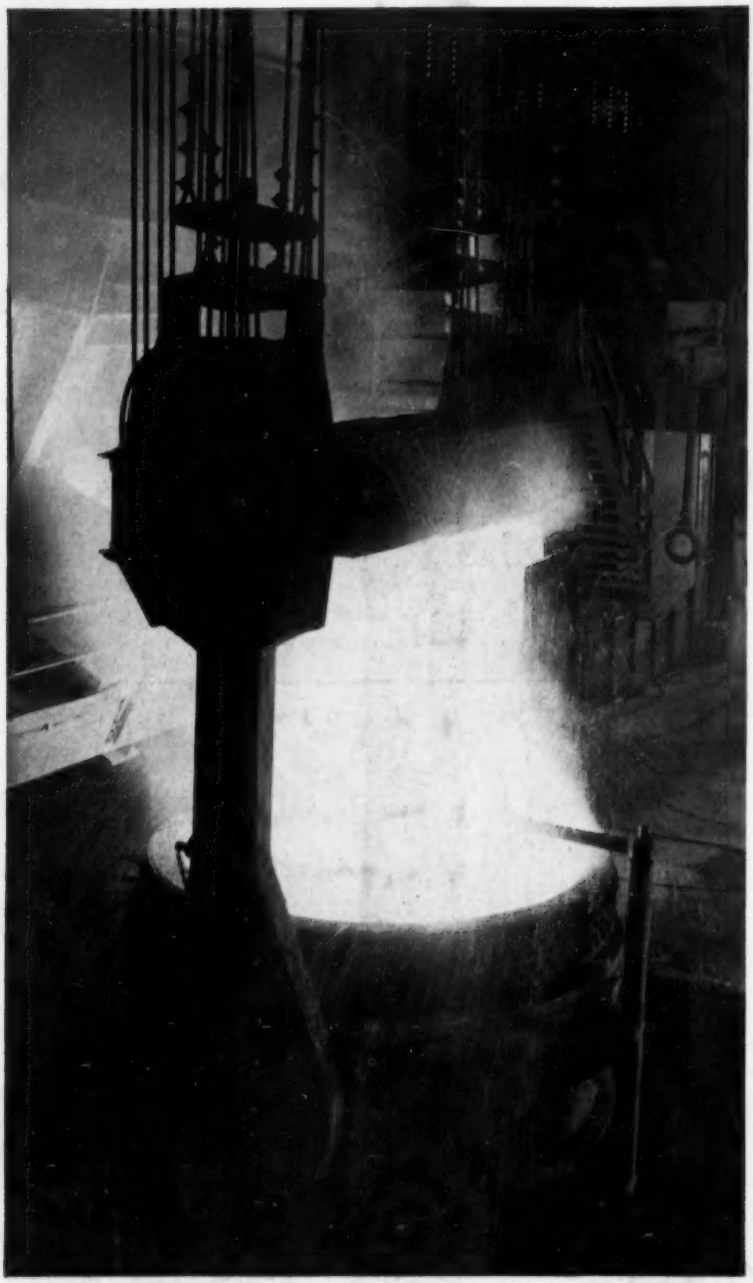
ABOVE—Peribonka No. 2 Powerhouse located at Chute a la Savane, Quebec. Owner: The Aluminum Company of Canada, Ltd.; Consltg. & Des. Engrs.: Shawinigan Engineering Co., Ltd.; Contr.: Pentagen Construction Co., Ltd. both of Montreal.

BELOW—Peribonka No. 1 Spillway located at Chute du Diable, Quebec. Owner and Engineers same as Peribonka No. 2 Powerhouse. Contr.: Fraser-Brace Engrg. Co., Ltd., Montreal.

THE MASTER BUILDERS CO.

CLEVELAND 3, OHIO • TORONTO, ONT. Subsidiary of American-Marietta Company Cable Address, Mastmethod, New York

We make our own fine alloy steel — and make it nickel-rich — to make TIMKEN® bearings tougher

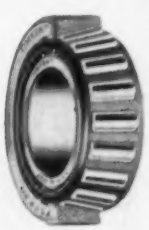


NICKEL makes steel tougher. So, our steel-making specialists don't skimp on nickel in the fine alloy steel we make for Timken® tapered roller bearings. They use exactly the right amount of nickel to give these bearings the toughness they need to withstand shock and last longer. Exacting quantities of chromium or molybdenum or both guarantee uniform hardness. By using the steel industry's first direct-reading spectrometer, we exercise hairline control of each element at the precise instant of tapping the furnace.

Rolling, annealing, and cooling are done with the same meticulous care. And every race and roller that goes into a Timken bearing is precision case-carburized to give it a hard, wear-resistant surface over a tough, shock-resistant core.

We've been specializing in the production of fine alloy steel for almost forty years. We're the only bearing manufacturer in the country that makes its own steel, because it's the only way we can make sure the quality of our bearing steel is just the way we want it. Steel is the heart of the bearing. That's why we insist on controlling bearing quality *every* step of the way—from melt shop to final bearing inspection. And that's why we don't skimp on the use of nickel.

To be absolutely sure of the highest performance standards in the equipment you build or buy, always specify Timken tapered roller bearings. They are made from seamless tubing or forgings by the most modern processes, under strict control. Only Timken bearings roll so true, have such quality thru-and-thru. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

Only **TIMKEN**® bearings roll so true, have such quality thru-and-thru